MARCH 12, 1953

ENGINEERING NEWS-RECORD

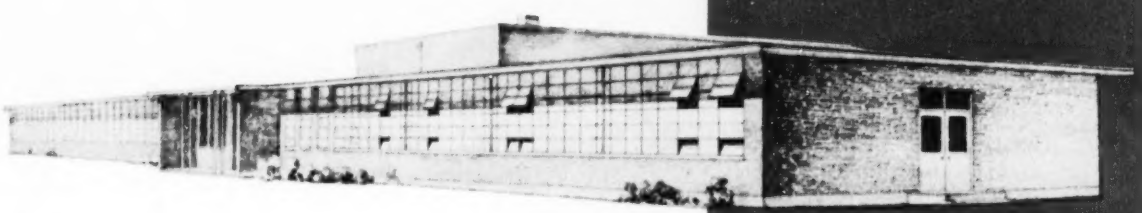
SEVENTY-NINTH YEAR OF PUBLICATION

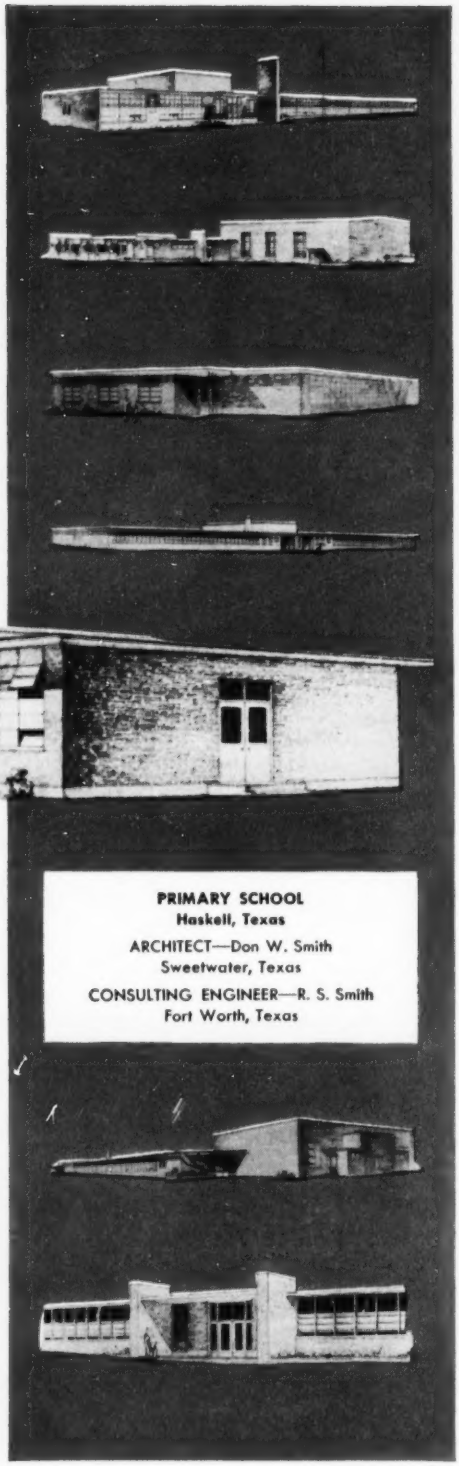
★ OHIO COURT UPHOLDS REDEVELOPMENT

★ CAN SEA POWER BE TAPPED?

A McGRAW-HILL PUBLICATION

This West Texas round-up of
RADIANT HEATED SCHOOLS
marks
BYERS WROUGHT IRON PIPE
as top "brand" for protection





PRIMARY SCHOOL
Haskell, Texas
ARCHITECT—Don W. Smith
Sweetwater, Texas
CONSULTING ENGINEER—R. S. Smith
Fort Worth, Texas

The long established record of Byers Wrought Iron pipe as the number one choice for radiant heated schools receives another vote of confidence in West Texas. Within a 75 mile radius of Sweetwater, 10 elementary school buildings, all built in the last three years, are safeguarded against premature radiant heating failure with Byers Wrought Iron pipe.

The drawings illustrated here are representative of the modern, functional architectural treatment of these schools, designed by Don W. Smith.

Byers Wrought Iron pipe has maintained its leadership in radiant heating because of its unusual combination of advantages. It is readily formed and welded, which speeds and simplifies installation. Its emission rate is high. It expands and contracts at practically the same rates as concrete and plaster, and so can be safely embedded in these materials. It has ample mechanical strength to withstand damage during installation periods. And its corrosion resistance under similar operation conditions has been demonstrated in hundreds of installations, over periods of many years.

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It stands to reason that Goodyear, who has built more tires for more purposes than anyone else on earth, can help cut *your* operating costs, too!

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Robert F. Boger
Publisher

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And that's the main thing about a Northwest! You're always prepared for the tough ones. You're equipped with the maximum in digging ability even when the jobs look easy—you're ready when the unexpected surprises you because your Northwest is built for the hardest job a Shovel, Crane, Dragline or Pullshovel has to do. Simplicity reduces upkeep and adjustment and cuts "down" time. Ease of operation without delicate mechanical complications is assured by the "Feather-Touch" Clutch Control. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and make spotting easy. The Cushion Clutch eliminates shock overloads before the shock gets to the machinery. Convertibility from Shovel, to Crane, Dragline or Pullshovel makes it easy to handle any excavation or material handling problem with the right equipment.

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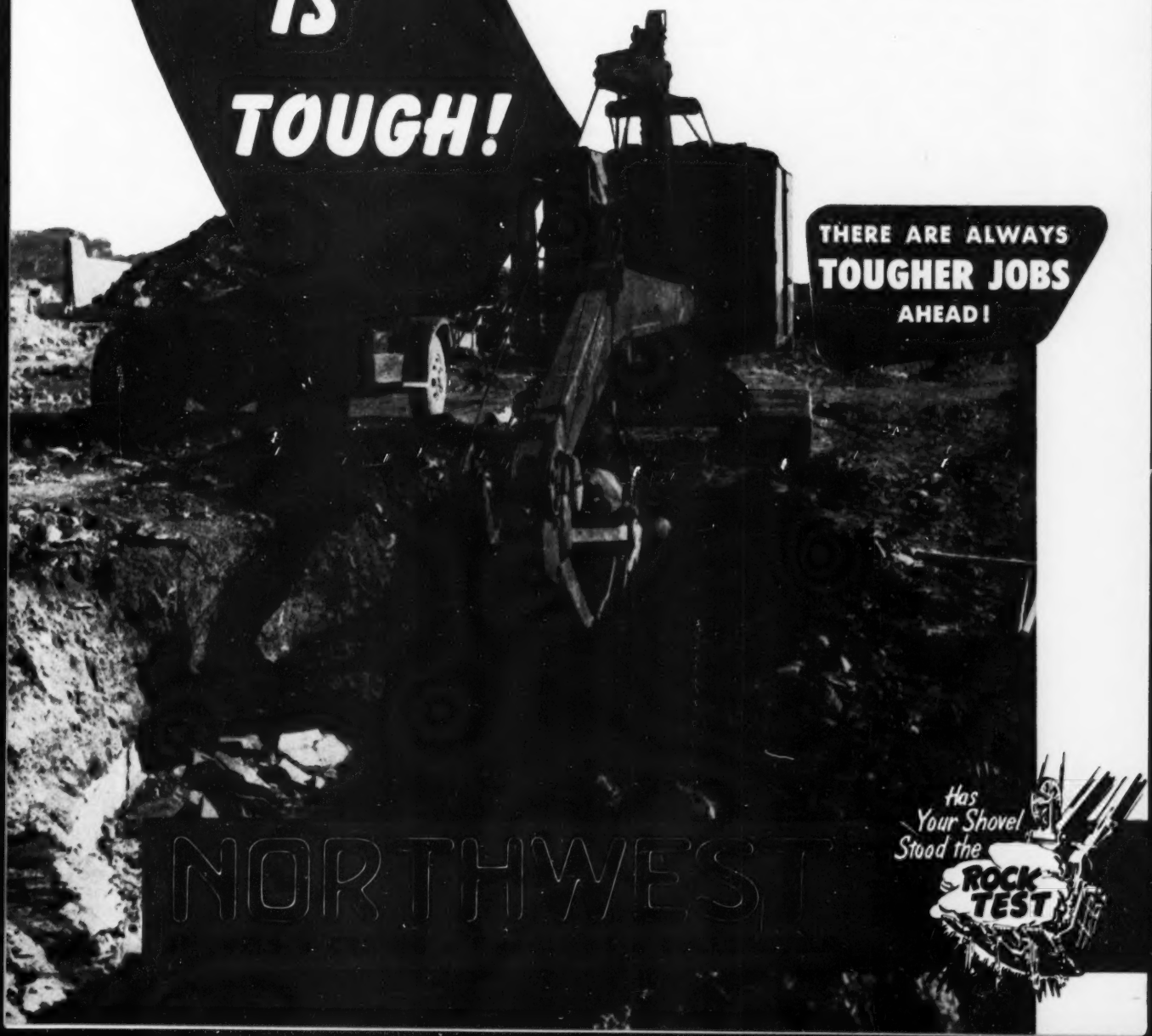


Mack comes in costs go down

It happens all the time. A truck user finds that heavy loads, rigorous weather, or tough terrain are proving too much for the trucks he owns. Frequent breakdowns . . . interrupted output . . . excessive repairs—all conspire to boost his costs and cut his profit margin. Then—if he's smart—he switches to Mack six-wheelers.

And that's where he gets a real eye-opener. Because even under the most adverse hauling conditions—hub-deep mud, slippery sand or pitted rock-strewn ground—his Mack six-wheelers keep the big loads moving on dependable, time-saving, cost-cutting schedule.

The reason why? It's found in Mack's Balanced Bogie with exclusive Power Divider that assures positive traction no matter how tough the going. Acting normally as a true differential the Mack Power Divider delivers torque between the two bogie axles in proportion to wheel traction, thus eliminating useless wheel slippage and spinning.

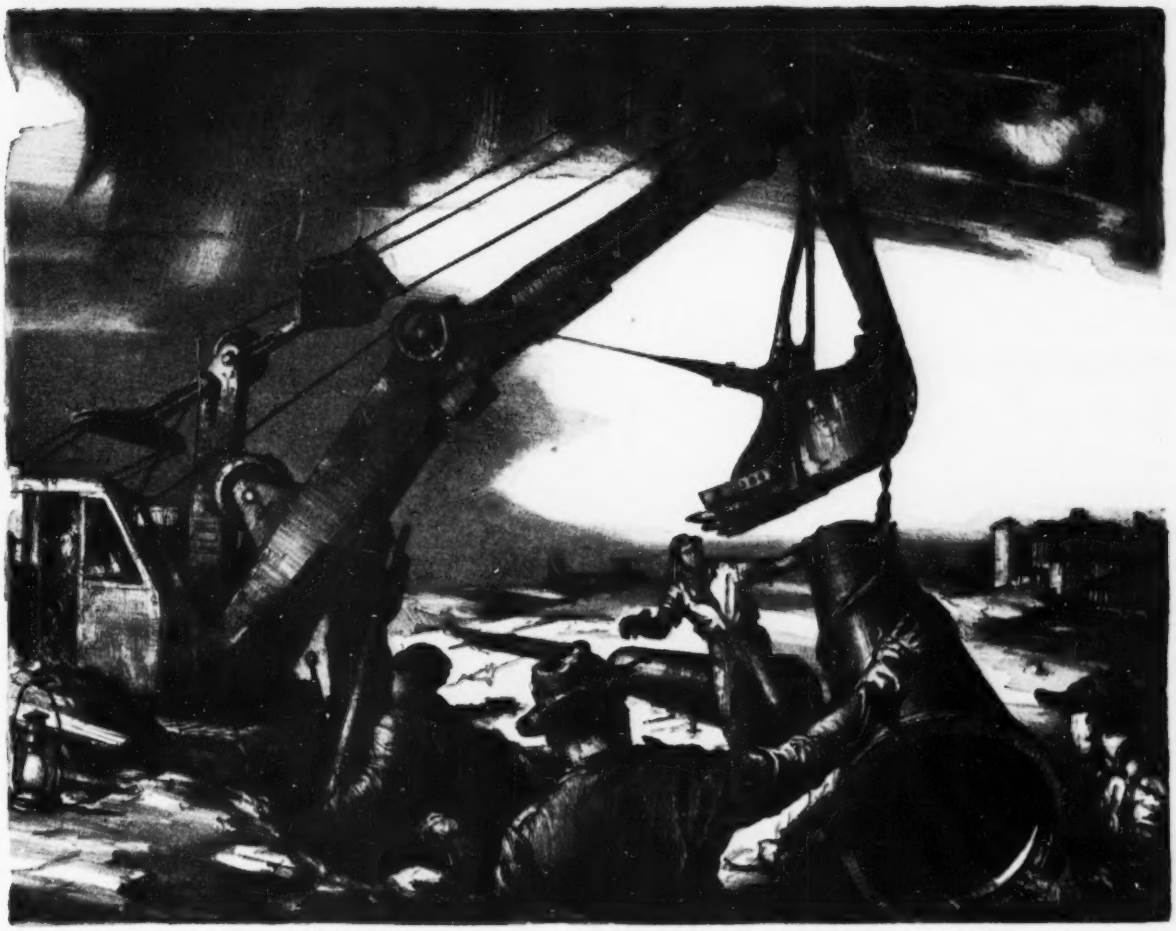
Mack's Balanced Bogie and Power Divider combine with numerous other outstanding Mack features to give you the power, strength, traction and easy maintenance you need to handle the biggest loads—with greater profit to you. Your nearest Mack branch or distributor will gladly give you all the facts.

Mack TRUCKS

. . . outlast them all

Mack Trucks, Empire State Building, New York 1, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

A. Muratore Contracting Co., Brooklyn, N. Y., is typical of numerous contractors who switch to Macks and find they're the answer to lower-cost operation.



Lithographed on stone for U. S. Pipe and Foundry Co. by John A. Noble, A.N.A.

THIS RURAL SCENE is not an unusual background for cast iron pipe. The installation might be a water supply line for a city nearby. It could be a sewer force main leading to a treatment plant. Also it might be a gas transmission line for a city, in which case it would unquestionably be of the mechanical joint type.

U. S. cast iron pipe in sizes 2-inch through 24-inch are cast centrifugally in metal molds with bell-and-spigot; mechanical joints and plain ends. All sizes of flexible joint and integral flange pipe and all pipe 30-inch and larger are cast by the pit cast process. By whichever process the pipe is made, high quality is assured with the modern control methods employed during its manufacture.

United States Pipe and Foundry Co.,
General Offices, Burlington, N. J.
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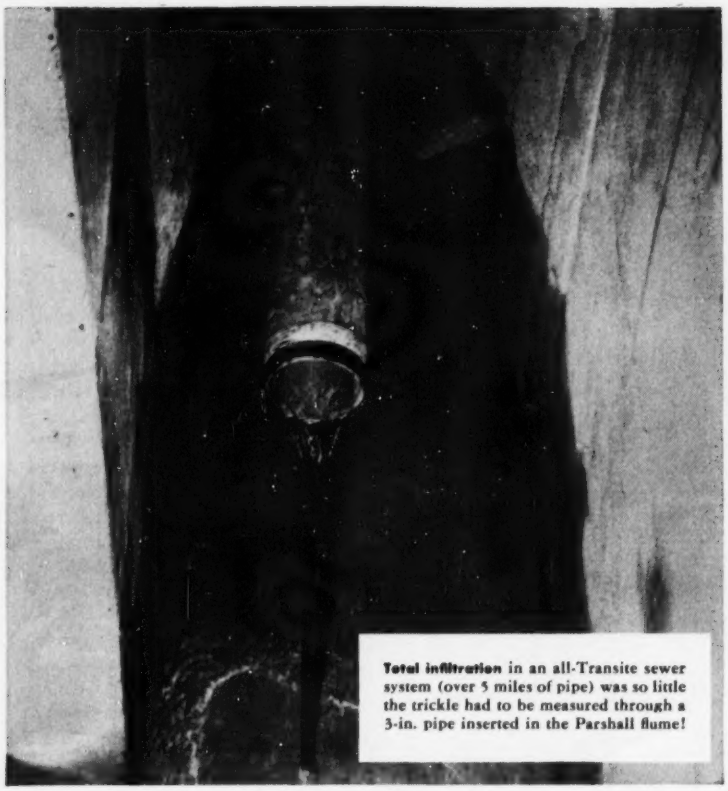
cast iron
PIPE
FOR WATER, GAS, SEWERAGE AND INDUSTRIAL SERVICE

You'll have less infiltration . . .

reduce treatment costs . . .

conserve plant capacity . . .



Total infiltration in an all-Transite sewer system (over 5 miles of pipe) was so little the trickle had to be measured through a 3-in. pipe inserted in the Parshall flume!

—ALL because of this RING-TITE JOINT used with Transite Sewer Pipe

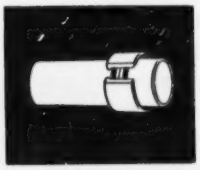
THE reduction of ground-water infiltration brought about by the Ring-Tite® Joint—now standard on all sizes of Transite® Sewer Pipe—can lead to a number of cost-saving results.

For example, on one recently installed Ring-Tite System using 28,540 feet of Transite Sewer Pipe, in diameters of 6 through 18 inches, the infiltration per inch of diameter, per hour, per mile of pipe came to a mere 0.85 gal. This low infiltration (including that from manholes and connections to house sewers) was achieved despite the fact that a considerable portion of this installation was below the prevailing ground water table. (For specification purposes, an infiltration allowance of 10 gallons per inch of diameter, per hour, per mile of pipe may be used with Transite Sewer Pipe.)

Obviously, such minimum ground-water infiltration helps reduce the load on treatment plants, cuts down on treatment costs, and conserves plant capacity for future expansion needs. This reduced infiltration plus Transite's high flow capacity (Manning's N=.010) often permits the use of smaller diameter pipe for new installations.

For further information on how this Ring-Tite Joint, used with corrosion resistant asbestos-cement Transite Pipe can help reduce your sewage costs, write Johns-Manville, Box 60, New York 16, N. Y. Ask for folder TR-103A.

Why the RING-TITE JOINT cuts your sewage costs



Two rubber rings and Transite Sleeve (cutaway) can be assembled quickly over Transite Pipe ends to make a pressure-tight joint. These flexible joints effectively absorb vibration, help compensate for soil movements.

TIGHT ALL THE WAY

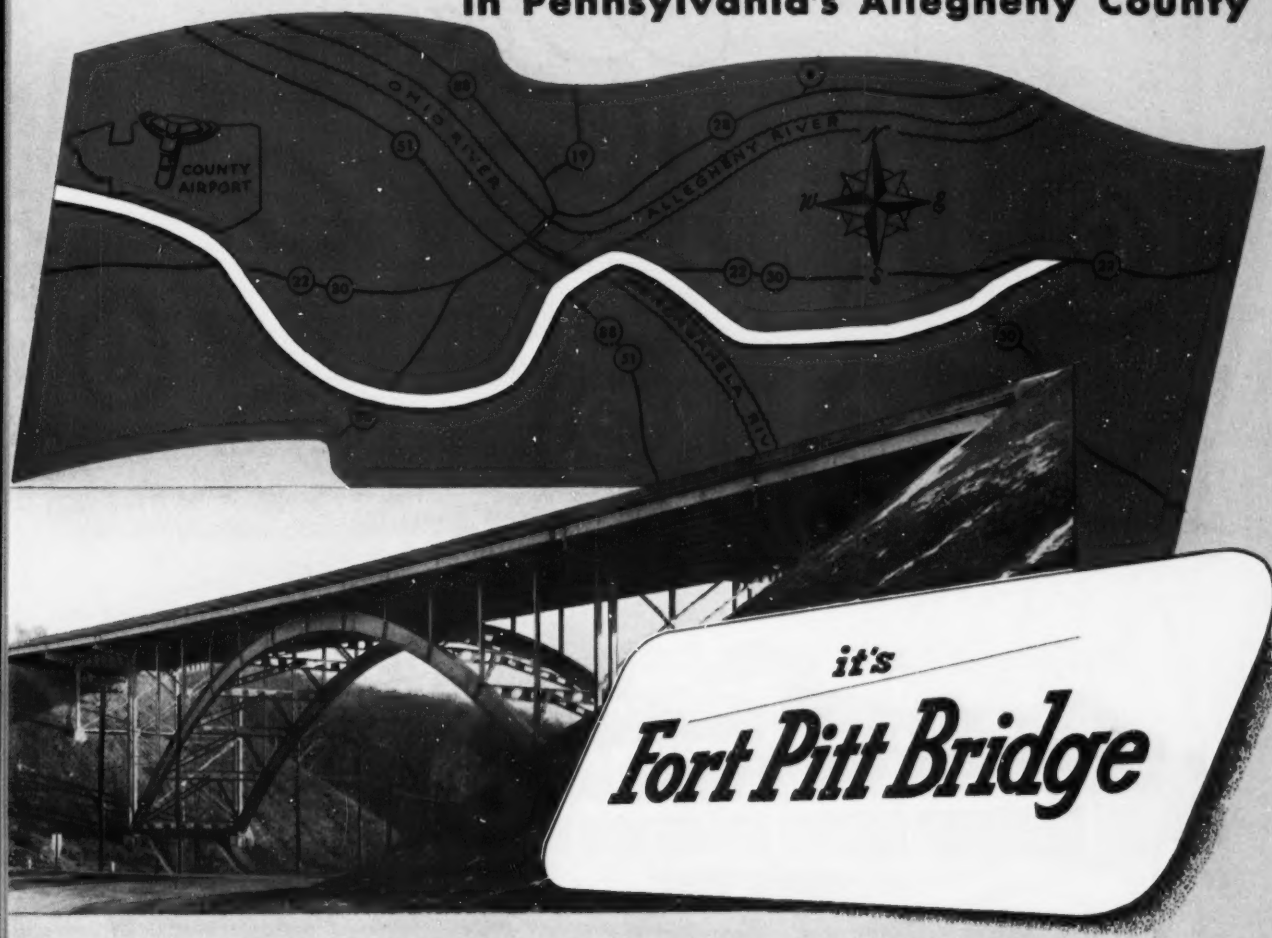
Johns-Manville Transite Building Sewer Pipe assures a tight sewer system throughout. Many municipal officials are insisting that house and building connections to their sewage lines be made with Johns-Manville Building Sewer Pipe to assure tightness throughout their systems. This pipe also has the rubber ring sealed joint that is shown above.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville TRANSITE SEWER PIPE

ON THE *NEW* PENN-LINCOLN PARKWAY

in Pennsylvania's Allegheny County



it's

Fort Pitt Bridge

Airview shows interchange connecting Penn-Lincoln Parkway with Airport Parkway to Greater Pittsburgh Airport

Now under construction is the modern Penn-Lincoln Parkway—a 27-mile, intersection-free highway which will run completely through the city of Pittsburgh. When completed it will be a valuable time saver—both for local traffic and east-west travel.

It was logical that Fort Pitt Bridge—with its 56 years of practical experience in the fabrication and erection of steel bridges of all types—was selected to participate in the construction of many of the key structures on this new highway.

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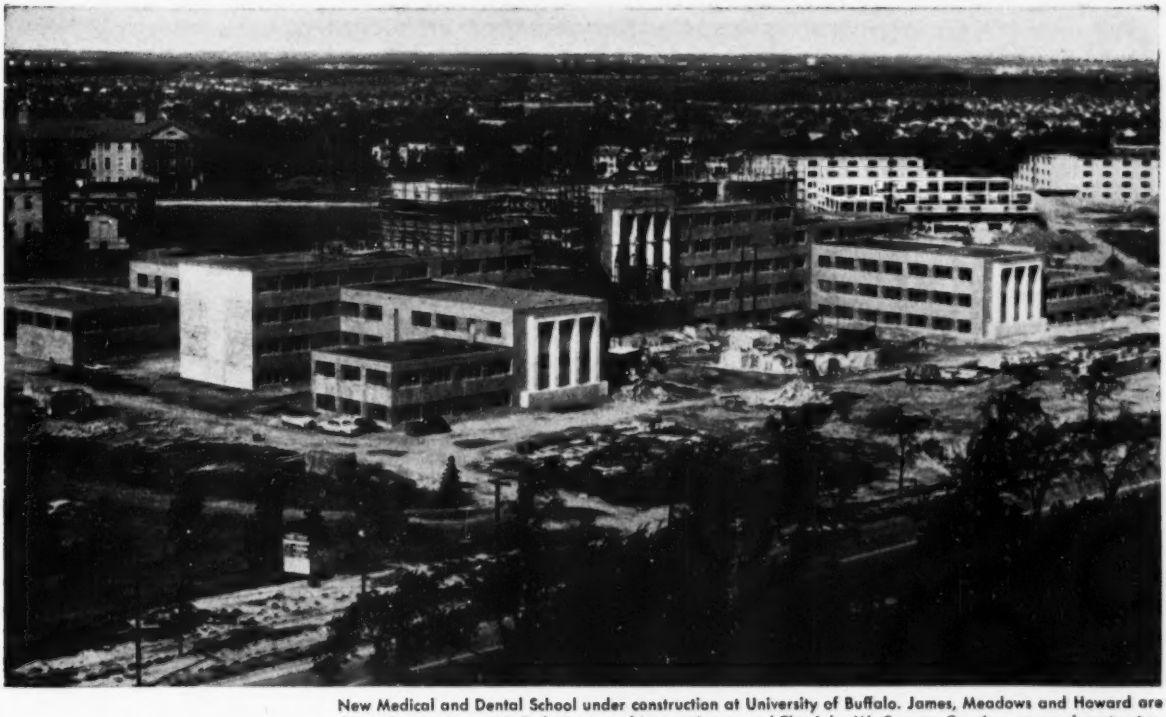

New Medical and Dental School under construction at University of Buffalo. James, Meadows and Howard are the architects; James N. DeSerio, consulting engineer; and The John W. Cowper Co., Inc., general contractor.

880 tons of fabricated reinforcing bars in new Buffalo medical-dental school

The new Medical and Dental School now under construction at the University of Buffalo will accommodate 80 medical students and 100 dental students. The H-shaped building, varying in height from two to five stories, provides 200,000 sq ft of floor area for classrooms, laboratories, amphitheaters, library and administrative offices. The concrete framing of the new building contains 880 tons of Bethlehem Reinforcing Bars.

These bars, made from entirely new-billet steel, were fabricated in Bethlehem's nearby Lackawanna Plant to meet the exact and varying specifications for the school. They were first sheared to proper length and accurately shaped on bending machines. They reached the job-site bundled and tagged, with bar lists included.

Specially designed lugs, high and closely spaced, give Bethlehem Reinforcing Bars firm anchorage in concrete. These lugs minimize slippage at working loads and check the formation of wide tensile cracks.

Bethlehem's bar fabricating service can speed your next concreting job. Call our nearest sales office for full information, or write to us at Bethlehem, Pa.

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A TYPE THAT WILL DO YOUR JOB BEST

MODEL 543

This self-propelled loader is mounted on a tractor-type chassis and pneumatic tires for traveling from job to job at rates up to 15 m.p.h. Equipped with a hydraulic swivel conveyor, it has the reach to load highest trucks, long trucks and trailers, and trim the load to full capacity every time. Capacity—3 cubic yards per minute. Easily converted for loading coal or snow.

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This crawler-mounted, 3 cubic-yard per-minute Bucket Loader has the stability so often necessary in typical truck loading operations—in pits, on soft or rocky ground, etc. Built for heavy, continuous operations, it is economical enough to justify itself in intermittent service. Complete accessories are available, including single and double deck vibrating screens for loading, screening and scalping simultaneously.

Barber-Greene

Aurora, Illinois, U. S. A.

READER COMMENT

"Them were the days"

Sir: In the Dec. 18 issue, p. 27, there was a news item saying that the Pennsylvania R. R. would spend $27,000,000 on improvements, including the modernization of the Enola Yards.

Modernization of the Enola Yards? The Enola freight classification yard was built 50 years ago and at that time was considered the most modern and largest classification yard in the United States. The resident engineer for the PRR was George Nauman and the contractor was H. S. Kerbaugh, Inc., at that time admittedly the largest contractor from point of equipment and capital involved in this country. The writer was general superintendent.

There should be some articles on the Enola Yards in your files for 1902 to 1904, as your staff was represented on the work. I recall one very ambitious and competent young man named Goodell. He was a frequent visitor. A large number of photographs were taken by Goodell.

(John M. Goodell was editor of ENGINEERING NEWS-RECORD — Editor.)

The yard was on the west bank of the Susquehanna River. It was 9 miles long and over a mile wide, and contained 145 miles of track. There was 15,000,000 cu yd of unclassified excavation, largely rock and shale. The land along the east side next to the river was flat while at the west side the hills rose 60 to 150 ft. The hills were cut down and the lowlands filled up to 35 to 50 ft above the river.

There was a classification hump 50 ft above the track level. The first hump was about complete when the Operation Department came out on an inspection trip and decided the hump was too far north. So it was relocated at a new site a mile or more south. That added to the excavation and the contractor was paid to rehandle 300,000 cu yd. It was good digging and helped the contractor's profit item. Chief Engineer Brown paid us a visit twice a month, A. J. Cassatt, the president, about once a month. H. S. Kerbaugh, who had a large number of contracts at that time, paid us a visit every week or ten days; he never interfered with the work.

Five thousand five hundred men were employed. About 4,000 lived on the job in shanties provided by the contractor. Farm houses were used for boarding houses until they came in the way of excavation or fills. Three large hotels accommodating one hundred men each and a 12-bed hospital were built by the contractor. The hotels were operated by concessionaires. Two doctors and a male nurse had charge of the hospital where sick and injured were treated. It was the policy of the contractor, however, to remove serious cases to the Harrisburg hospital.

A charge of $1.50 a month was collected from each employee for rent and doctor. There were three camps, South, Central and Northern. There also was a commissary at the central camp, stables for 150 horses and mules, and a large machine shop equipped to overhaul and repair shovels, locomotives, cars, cranes, well drills, etc. Small commissaries were operated at the South and North camps. Pay days were once a month, on or about the 20th.

We built a reservoir on a hill and piped the water in 4-in. mains for the entire length of the job to supply shovels, dinkies and boilers. There were 25 steam shovels, 25 well drills, 150 rock drills, 150 narrow-gage dinkies, 200 4-cu yd dump cars, 4 standard-gage locomotives, derrick cars and locomotive cranes.

The work was in two shifts. Laborers' wages ranged from $1.25 to $1.50 per day of 10 hours, mechanics received $2.50, dinkey engineers $2.50, drillers $2.50, foreman $3.00 to $4.00 per day, walking bosses—now would be called superintendents—$125 a month straight time. On the steam shovels, the engineer received $135 per month, cranemen $100, firemen $75.

We laid 38.5 miles of track in one month. When Chief Engineer Brown received the estimate in Philadelphia he did not believe it was correct and called Mr. Nauman and said "George, your decimal point is in the wrong place. The estimate should be 3.85 miles." Nauman told him, "No, estimate is 38.5 miles." The chief came out the next day with an engineer corps from Philadelphia. They checked the estimate as correct. It was a record. We never equaled it again on the yard.

It was a great yard in those days, and now it is to be modernized. I wonder what that will mean.

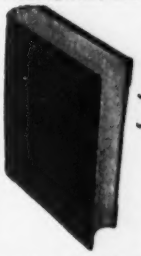
WILLIAM B. GRAY
Consulting Engineer,
Brooklyn, N. Y.

(Letters continued on page 14)

ROUTE LOCATION AND SURVEYING

Just Published!

1. Revised and enlarged third edition of this famous reference manual for field engineers gives problems and operations of surveying, planning, and designing highways; now includes data on railways, canals, pipe lines, and airways and airports. Gives special emphasis to curves and earthwork, advantages of easement spirals, and contains many new and complete tables to facilitate layout of curves. **By Thomas F. Hickerson, Kenan Prof. of Appl. Math., U. of N. C., 3rd Edit., 543 pages, 102 illus., $6.00**



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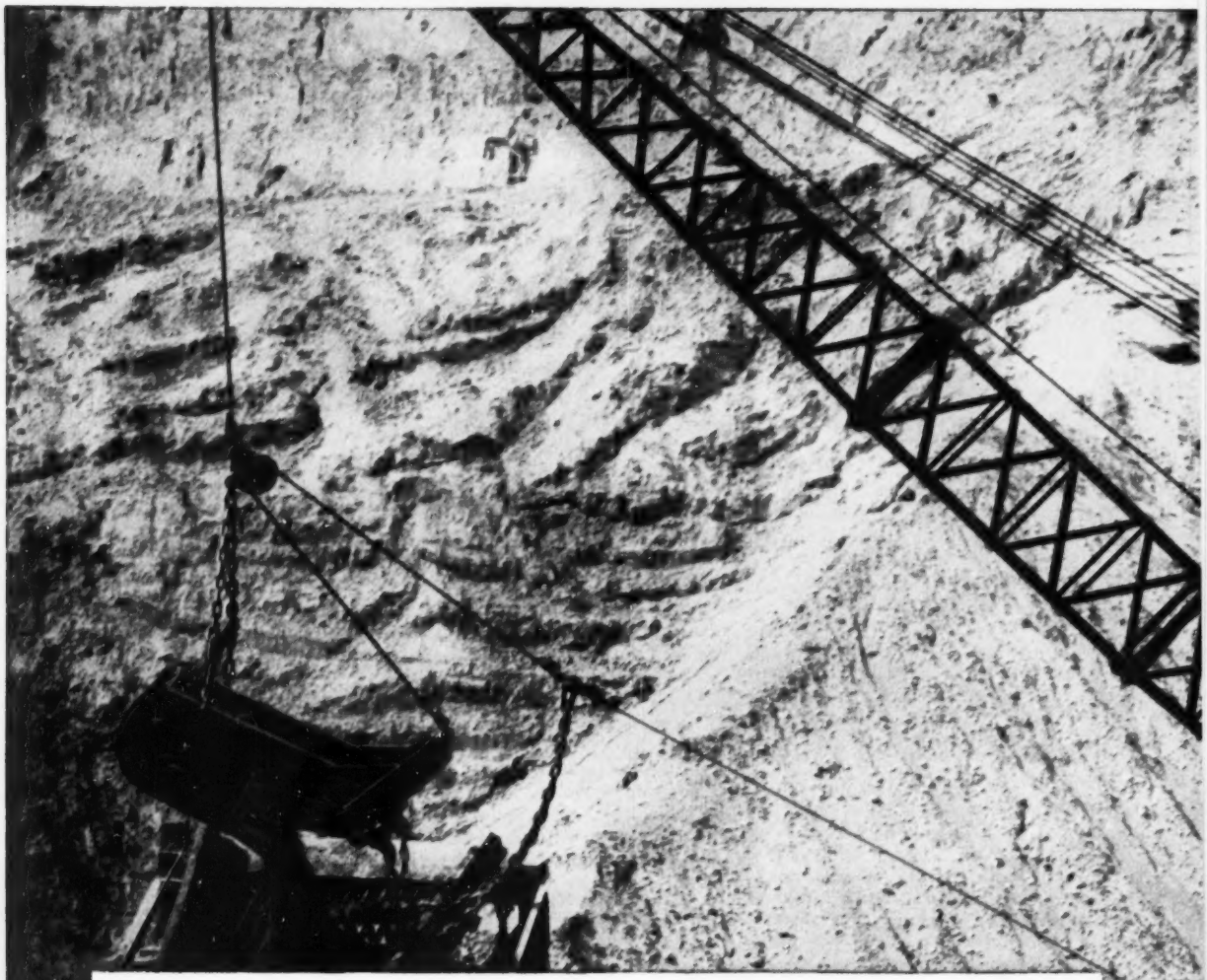

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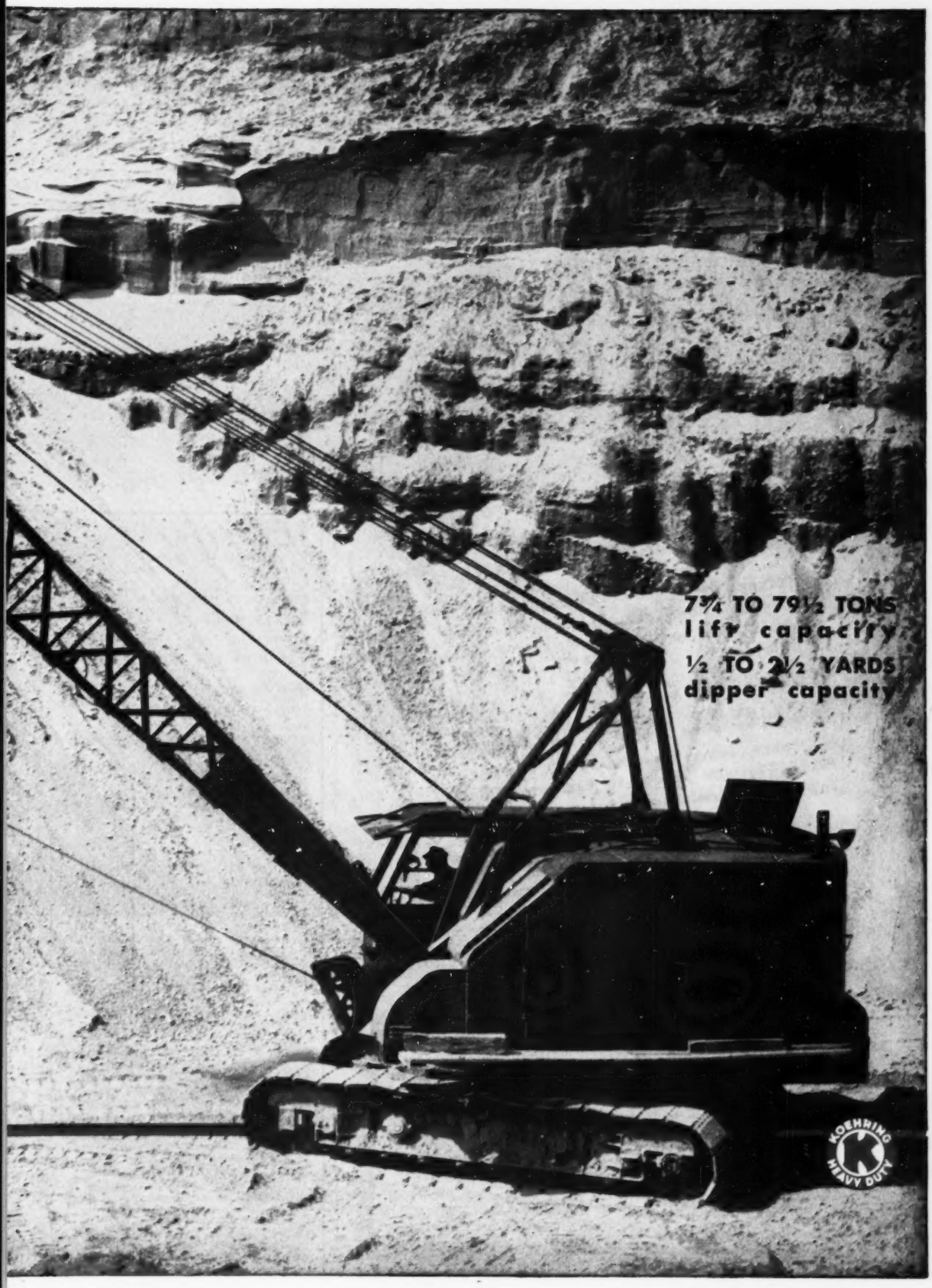
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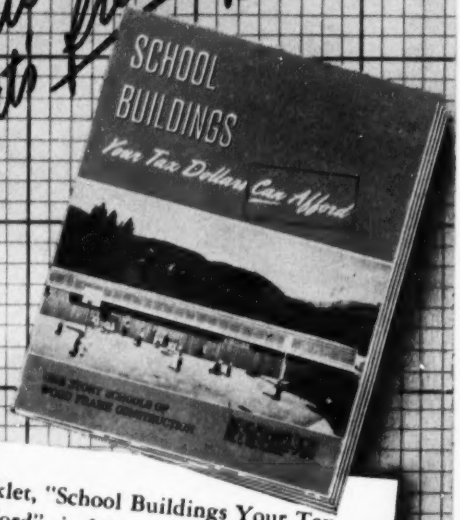

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READER COMMENT

Not unique

Sir: The caption under the picture on page 38 of the Jan. 22 issue states that guniting of the rock-clay core of the rockfill Kenney Dam in British Columbia is "unique." This was done on San Gabriel No. 1 dam about 17 years ago.

L. F. Harza
Consulting Engineer
Chicago, Ill.

Circumference of ellipse

Sir: A new formula for the circumference of an ellipse has been developed by a Norwegian engineer, J. B. Fergestad. He gives the expression:

$$C = \pi \left[3(a + b) - \sqrt{(3a + b)\,(3b + a)} \right]$$

in which a and b are the semi-major and semi-minor axes. This formula has a maximum error of 0.392%.

Einar Salvig
Denver, Colo.

CALENDAR

N. Y. State Association of Highway Engineers, Hotel Statler, Buffalo, N. Y., Mar. 17-20.

American Railway Engineering Association, annual meeting, Palmer House, Chicago, Mar. 17-19.

Southern Municipal and Industrial Wastes Conference, University of North Carolina, Chapel Hill, Mar. 19-20.

Third Midwestern Conference on Fluid Mechanics, University of Minnesota, Minneapolis, Mar. 23-25.

American Congress, surveying and mapping, Shoreham Hotel, Washington, D. C., Mar. 23-25.

National Public Health Engineering Conference, Gainesville, Fla., Mar. 24-25.

Conference on prestressed concrete, Newark College of Engineering, Newark, N. J.—Apr. 6-9-13-16-20-23-27 and 30—7:30 to 9:30 P. M.

Building Officials Conference, Hotel Baker, Dallas, Tex., April 6-9.

Diamond Jubilee Convocation, Case Institute of Technology, Cleveland, Ohio, April 10-11. Topic "The Challenge of Free Men in the Atomic Age."

Tennessee Highway Conference, University of Tennessee, Knoxville, Apr. 16-17.

Pacific N. W. Industrial Waste Conference, State College of Washington, Pullman, Wash., Apr. 16-17.

Concrete Reinforcing Steel Institute, annual meeting, the Carolina Hotel, Pinehurst, N. C., Apr. 27-May 2.

Pacific N. W. Conference, ASCE, Seattle, Wash., Apr. 30-May 2.

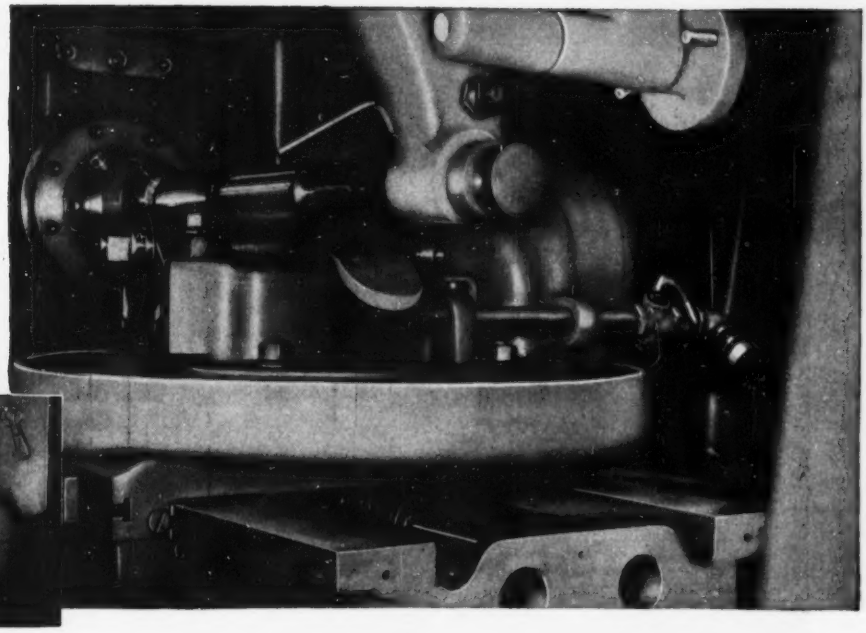
American Water Works Association, annual meeting, Municipal Auditorium, Grand Rapids, Mich., May 10-15.

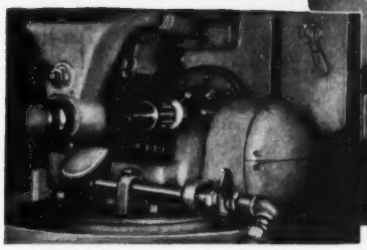
Biennial Inland Empire sewage works school, State College of Washington, Pullman, Wash., May 14-16.

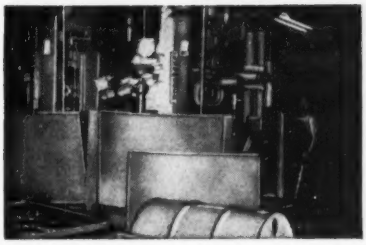
Society for Experimental Stress Analysis, Hotel Schroeder, Milwaukee, Wis., May 20-22.

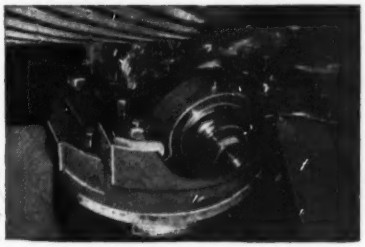
National Society of Professional Engineers, Sheraton-Beach Hotel, Daytona Beach, Fla., June 18-19.

American Society for Engineering Education, annual meeting, University of Florida, Gainesville, June 22-26.









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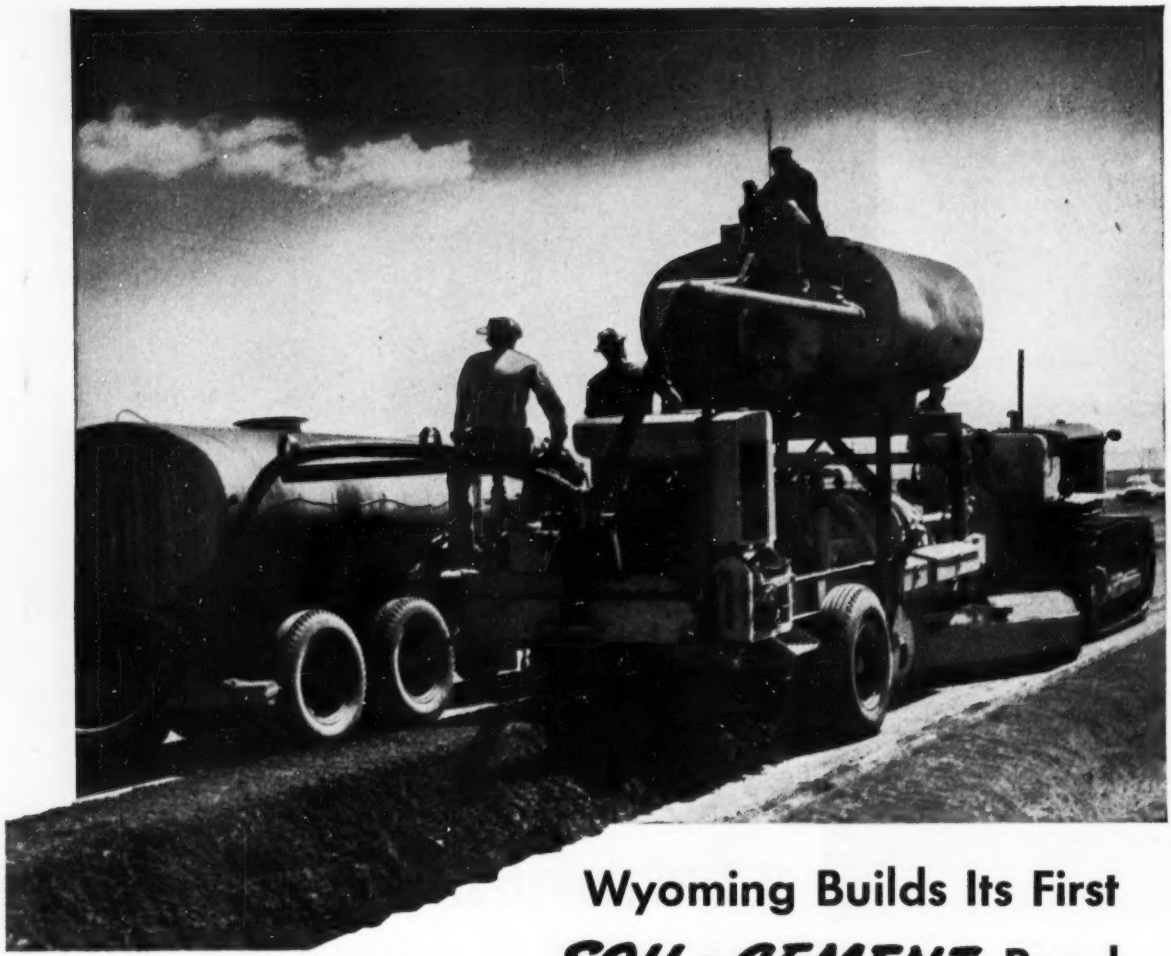

Wyoming Builds Its First *SOIL-CEMENT* Road

In building its first soil-cement road,* 17 miles long, Wyoming became the 45th state to use soil-cement. This also was the first time scoria was used as a soil in soil-cement paving.

Used alone, scoria, a shaly material forming the overburden of burned out coal beds, is not considered a good base material. But tests proved it could be combined with portland cement to make excellent soil-cement. The alternative was to build a gravel base requiring a 65-mile haul of acceptable material. By the use of soil-cement a saving of thousands of dollars per mile resulted.

This 17 miles of soil-cement pavement proved so satisfactory that it led to the paving of several blocks of streets in the city of Gillette. For this work the local scoria soil again was used.

Scoria thus extends the long list of miscellaneous materials, such as caliche, chat, chert, cinders, marl, slag, shale, brick waste and roofing granules, that have been used successfully in soil-cement in the 18 years since scientific controls were developed to insure dependable performance for this low-cost pavement for roads, streets and airports not subjected to heavy traffic.

Soil-cement pavement is economical because (1) most of the required material is soil on or near the site, (2) construction is fast and simple and (3) maintenance, as proved by experience on ever-increasing mileage, is low.

For further information about paving with soil-cement write for free, illustrated literature. It is distributed only in the U. S. and Canada.

*Soil-cement pavement consists of soil-cement base and bituminous surface

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THE CONSTRUCTION WEEK

- **Toll roads for California?**—Toll-road proponents are watching closely as California's legislators argue recommendations of the State Division of Highways that a new bridge over Carquinez Straits (in San Francisco Bay) be toll-financed. Separate toll would be charged for bridge use only, and for use of freeway bridge approaches.

  Interesting point is that, while the division previously has approved tolls to pay off bridge costs, it has resisted the idea of toll roads.

  Minimum cost of the total improvement would be about $45.5 million—of which the bridge would cost about $17.6 million.

- **Big power for Yukon?**—That announcement by Frobisher, Ltd., a Canadian mining concern, that it would survey water-power resources of the Yukon, may develop into one of the world's biggest water power and metallurgical refinery projects.

  The Canadian press discussed the matter only briefly, but here's what's involved:

  An area of 17,000 sq mi, including Atlin Lake, Taku Lake and Lake Laberge—with a potential of more than 5,000,000 hp. Compare that with the $550 million Aluminum Co. of Canada is spending to develop some 1,600,000 hp at Kitimat.

  Frobisher's plans for development include "a wide range of metals that can be smelted by cheap electricity."

  That would include aluminum, but is likely also to include magnesium and other metals.

- **Education front**—The efforts to get more engineers into training, and to improve standards of construction bore these fruits this week:

  New York University planned to use closed-circuit television in theaters, March 21, to show high school juniors and seniors the opportunities for careers in science and engineering;

  Wayne University in Michigan, in cooperation with the Building Officials Conference of Michigan, offered an in-service course in "The Administration of Building Regulations";

  Three-dimensional pictures moved into the education field, with the announcement by the Revere Camera Co. that use of such slides for teaching engineering and use of materials is growing rapidly.

- **Engineers' Week**—National Society of Professional Engineers headquarters was well pleased with reports of successful observances of Engineers' Week (Feb. 22–28). Across the U.S., engineering schools and local chapters held open house; governors and local officials proclaimed the occasion; radio presentations and plays were given, and a television show featured Sen. Ralph E. Flanders of Vermont, himself an engineer.

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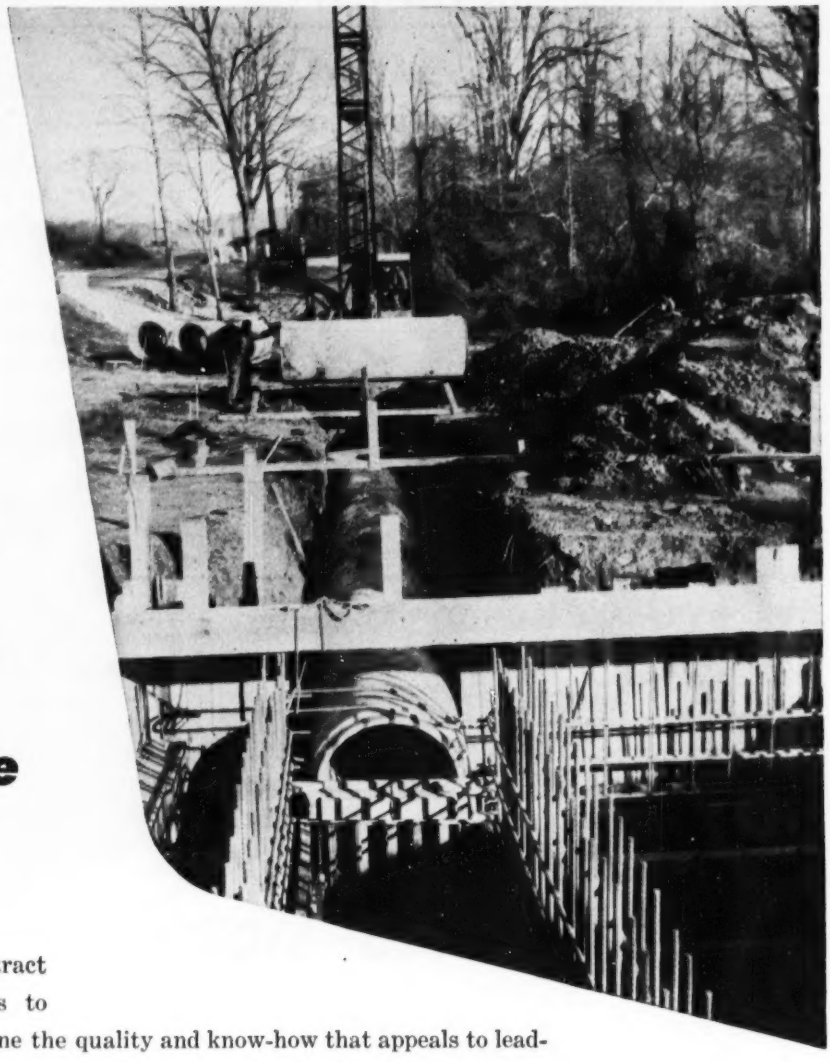

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WASHINGTON OBSERVER

Cuts in construction spending are beginning to show—and you can look for detailed blueprints for future reductions from Congress. Chairman Taber of House Appropriations has a big crew of outside specialists checking the bureaus, including three men on Army civil works and six on Interior.

Here are reductions you can expect: entire $4-million construction fund proposed for Southeastern Power Administration will be killed. Most of the $4.6 million asked for Southwestern Power Administration is out. About $10 million is expected to be lopped off Bonneville Power Administration's $56-million construction spending plans. About 10% will be cut from Reclamation's $93.4-million budget.

Staff reports to be published will give clues to future cuts. Not all the committee's recommended cuts will be voted this year. But the fine-tooth comb will be kept handy for use the next time around.

•

Decision for or against federal construction of Hell's Canyon Dam is hard one for Interior Secretary McKay. So he's asking Federal Power Commission to delay its April 11 hearing on Idaho Power Co's application to go ahead with its Oxbow project—which is in direct conflict with a federal project.

•

Efforts to clip the power of the Secretary of Interior to authorize his own projects are building up in Congress. That's behind the fight in the House Interior Committee involving the Solano Irrigation Project in California. The 1939 Reclamation Act gives the Secretary the say on authorizing projects he finds "feasible." Opponents say that's too much power, that a Secretary by a stroke of a pen can "morally" obligate Congress to provide funds to build the project. In the Solano case, move is on to void authorization, then have Congress itself decide.

•

Wrangle over wastefulness of building codes isn't dead yet. It's kept lurking in the background by Eisenhower's unqualified blessing of a big government-industry materials conservation conference to be held sometime this fall.

Controversial propoals of last year's Paley Commission probably will be kept off the program to be drawn up in planning session next month.

But the construction industry could be target again if the conference decides to go for strong recommendations about putting research on materials use into effect. Paley Commission and other critics claim today's codes cause waste of strategic materials by banning use of substitutes.

•

Federal funds to make New York subways useable for air raid shelters are being sought by new civil defense chief Val Peterson. He's asking for some $7.5 million in his budget to match a similar amount from New York City. Up to now, the agency has gotten money only for construction research.

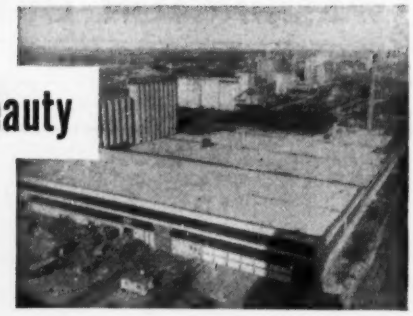
•

Bureau of Reclamation has turned out to be one of hottest spots in Washington. That's shown by length of time it has taken Eisenhower and McKay to find a successor for the Democrat's controversial Mike Straus.

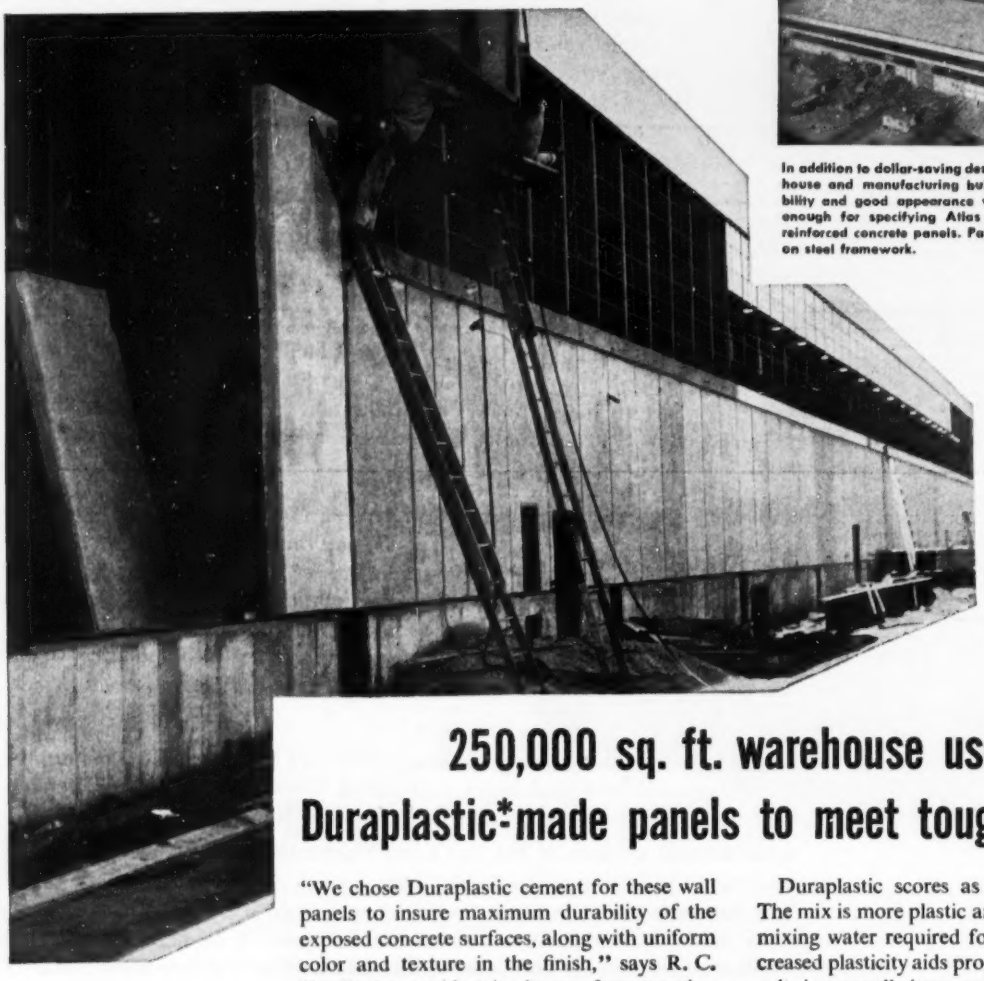
Job specifications say the new Reclamation Commissioner should be from West—but not from one of the seven Colorado River Basin states. He can't be a Reclamation employee, but he should be an engineer with management ability.

But heat comes from fights over federal vs. state control, private versus public power. A dozen or more names have been talked up—but they were either dropped by the Republicans for one reason or another, or the man himself turned down the job.

SPECIFIED: Maximum utility, economy and beauty



In addition to dollar-saving design for this huge new warehouse and manufacturing building in Milwaukee, durability and good appearance were also required. Reason enough for specifying Atlas Duraplastic cement in the reinforced concrete panels. Panels were job-cast and hung on steel framework.



Designed by
V. K. Boynton,
Consulting Engineer
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MARCH 12, 1953
VOL. 150, NO. 11
ENGINEERING NEWS-RECORD

PROPONENTS—Backing changes in New York state's engineering laws are seven major corporations. Stating their case here to ENR are: James L. Moore, Joseph Pope, V. Weaver Smith, and H. Ames Richards, Jr.

New York law prohibiting engineering practice by corporations under attack

Seven major engineering corporations seek amendment against opposition of state NSPE

A determined attack on the long-standing New York State's laws governing the practice of engineering was being fought out in legislative committee rooms in Albany this week.

Because the central point in the battle was the state's prohibition on practice of engineering by corporations, engineers and top management throughout the United States were watching the action with increasing interest.

On opposing sides in the attempt to revise the law were ranged a group of seven major engineering, construction, manufacturing organizations, and the New York State chapter of the National Society of Professional Engineers. None of the engineering "founder societies" has taken an official position on the matter.

Although the statute has been on the state's books since early in 1935, it was not until a 1952 amendment was added requiring biennial registration of corporations (individuals had always been required to register biennially) that the all-out attack came to a head.

• **Point at issue**—Key point in the attack is the provision of the education law (Art. 145) which specifically prohibits the practice of professional engineering by any corporation—unless (1) it was incorporated in New York State, (2) the corporation was practicing and continued to practice in and after 1935, (3) and the chief executive officer of such a corporation, and the persons carrying out the actual practice of engineering were licensed professional engineers.

Another exception is granted for corporations which construct or install "machinery or apparatus" which they have designed.

This law prohibits the formation of any new corporations to practice engineering (from April, 1935), and further prohibits the use of the word "engineering" or its derivatives in corporate names.

Opponents of the law—through joint bills dropped into the Albany legislative hopper Feb. 9 (and twice modified since) seek to amend it by substituting for the words "chief executive officer" the words "the chief executive officer in charge of its engineering and any other person or persons in responsible charge of its engineering activities." Other changes sought would insert the word "corporation" where necessary, according to proponents, to put corporations on the same basis as individuals on disciplinary proceedings and penalties.

• **Battle joined**—Although the law has been on the books almost 18 years, nothing much was done in opposition to it until this year—because little occurred under it by the state to disturb the status quo.

As originally written, the law did not require registration of corporations, as was required of individuals.

However, the 1952 legislature passed an amendment that provided for biennial corporate registration. And, under the law, any corporation not registered by March 1, 1953, was practicing professional engineering illegally.

Since the corporations involved in the present fight were formed either

OPPONENTS—Principal opponents of any change in the engineering laws are members of the National Society of Professional Engineers: Herald Beckjorden, state NSPE secretary, and Edward J. Nunan, state president.

after 1935, or were formed in other states, they found themselves in the position of being unable to continue their operations within the law.

Their answer has been to seek amendment of the statute.

• **Protagonists**—Backing the try at amendment (known as the Bennett-Carlino Bill, Senate Int. No. 1772, Assembly Int. No. 2051) are seven major corporations. They are:

Burns and Roe, Inc., Chemical Construction Corp.; Day and Zimmerman, Inc.; The M. W. Kellogg Co.; The Lummus Co.; Stone & Webster Engineering Corp.; and United Engineers and Constructors, Inc.

Fighting the change is the New York NSPE chapter, led by its president, Edward J. Nunan, and its executive secretary, Herald Beckjorden. D. B. Steinman, one of NSPE's founders and one of the proponents of the existing law, has also lent support to the campaign.

• **Arguments pro**—Supporting their stand against the existing law, both in briefs presented to state legislature committees and in interviews with ENR, the corporation representatives pointed out that 44 other states permit corporate practice—31 by statute, 13 by administrative procedure. Only three in addition to New York—Ohio, Rhode Island and Washington—prohibit such practice.

As to the question of responsibility, they contend that the amendment—providing that "the chief executive officer in charge of its engineering" office and all those responsible for its engineering activities be licensed professionals—would provide ample safeguards.

As further support for their stand, they called attention to the fact that corporations generally represent large aggregations of capital, thus making possible a large, varied staff, research, guarantees of performance, and that corporations can be and have been held responsible for improper actions. As to the charge that such changes would bring a flood of new engineering organizations into the field, their answer was: "Competition is the life of any business. We would welcome it."

They added that the law may be unconstitutional (it has never been tested in the courts) because it is discriminatory; that tax advantages would accrue to professional engineers if they could incorporate.

And one further point: As written, the law sets up a monopoly for the limited group of corporations specifically exempted.

• **Arguments con**—The NSPE has centered its major fire on the question of responsibility—although its leaders brought up a number of other objections.

Principal objection, as NSPE sees it, is that under a corporate setup, an employed professional engineer might be ordered to approve a design not in accordance with best practice—and he, not the corporation—would be responsible if a failure occurred.

NSPE, admitting that, in fact, the objectives it seeks do not include criticism of reputable corporations, such as sponsors of the bill, foresees the creation of hundreds of "engineering corporations," formed by get-rich-quick businessmen who hire a professional engineer to approve plans. This might well bring disrepute to the profession, as well as real danger to public health and safety.

• **Decision soon**—Both sides have presented briefs to the committees, and the Board of Regents and committee reports to the legislative bodies are expected within a short time.

Meanwhile, both sides have girded to carry the battle—through letter campaigns directed at the legislature and the Regents.

Decontrol of construction items lags behind hectic OPS moves

The construction industry has become one of the Administration's biggest headaches in the rush to decontrol prices.

Trucks—including dump trucks and self-propelled cement mixers—got out from under price ceilings, but a long list of construction items like structural steel, metal doors and window frames, lighting fixtures and building hardware, were still under study by OPS early this week.

Almost all consumer items made from steel and other metals have been decontrolled, but the decontrollers can't make up their minds about construction components like humidifiers, sheet-metal products, plumbing and heating equipment, air-conditioning, and built-in steel kitchen cabinets.

Almost all industrial services have been taken out from controls—but again the construction industry gets slower treatment. OPS decontrolled services like machining, polishing, plating, and the shaping of metals by stamping or screw machines.

At the same time, it specifically emphasized that ceilings were still in effect on such services as fabricating structural steel, miscellaneous and ornamental iron and vessel shop products for field assembly or erection. These services are covered under ceiling Price Regulation 156.

Decontrol orders have been issued so rapidly—in five groups since the new Administration took over—that officials won't try to guess when the job of dropping all controls will be complete. Decontrol already has moved faster than most top OPS officials thought was possible a few weeks ago, but the construction industry seems firmly established somewhere close to the end of the procession.

Columbia Basin projects near end of funds

The practice of withholding appropriations for public works until money authorizations have been voted—something Republican lawmakers generally have been fussy about in the past—seems likely to plague the new GOP-controlled Congress.

Right now the Army Engineers are approaching the authorized limit of spending for a group of Columbia Basin projects. This limit is now set at $192 million, and about $182 million has been appropriated already. Under a strict interpretation of legislative procedure, this would mean the appropriations for the next fiscal year for this group would have to be limited to a mere $10 million unless the authorization is raised.

At least three large projects in Washington and Oregon are involved for which the Truman Administration requested some $43.3 million for construction during the next fiscal year. Projects and amounts asked are: Detroit Reservoir, $10.2 million; Lookout Point Reservoir $13.3 million and The Dallas Lock and Dam, $19.5 million. All are multi-purpose projects with large hydroelectric operations.

It is not an easy matter to push through a bill raising the authorizations for these few projects. Such increases usually are handled in omnibus civil-works bills only after long deliberation and extensive participation by members of Congress. These are known as "pork barrel" bills, and many congressmen insist that their favorite projects be considered before an omnibus bill is put together.

The Columbia Basin projects are the only ones hitting the authorization limit during fiscal 1954, but a lot of others will be in the same fix during the next fiscal year. Congressmen from other areas are watching for an opening.

Engineering in California highlights ASCE meeting

P.G.&E. $1-billion postwar program; other past, present and future West Coast works discussed

The American Society of Civil Engineers met in San Francisco last week and, appropriately enough, California and its engineering problems were given major emphasis in the technical program. Some 800 members attended the four-day meeting. Leading subject in the 20 technical-division sessions was Pacific Gas and Electric Company's $1-billion, 10-year postwar program that will develop nearly 3,000,000 kw of new generating capacity—all privately financed.

• **Huber reviews history**—ASCE's president, Walter L. Huber, who has practiced engineering in San Francisco for a half century, reviewed a century of development in California in his presidential address. He told how hydraulic mining of gold spurred construction of water supply canals, of the growth of irrigation and of railroading. Also significant were the development of the Pelton water wheel and the first long-distance electric power transmission. These factors play a leading role in the greatest recent-day California construction program—that of P. G. & E.

Biggest development in California's postwar years was described in general terms by Walter Dryer, P. G. & E. vice-president and chief engineer. Since V-J Day his company has spent $1 billion on both gas and electric works. Some three-fourths of this is for new generating capacity—341,000 kw of hydro and 1,342,000 kw of steam. An additional 1,273,000 kw—mostly steam—is under construction to be completed by 1955.

J. Barry Cooke, senior civil engineer with P. G. & E. said that P. G. & E. has 60 hydro plants, 10 of which have been built in recent years. These vary in flow from 50 to 4,000 cfs and in head from 300 to 2,600 ft. The newest unit, the recently completed Bear River development, has two points of interest:

1—The 22-mi power tunnel was designed for 8x9-ft section but the successful bidder, Walsh Construction Co., was allowed to substitute an 8½ x 11-ft "Gothic" arch section for construction efficiency;

2—A vertical-shaft, multiple-jet 40,000-hp turbine was chosen for reasons of expected higher efficiency— two to three percent; less danger of disastrous water-hammer failure should one nozzle fail, and higher efficiency at low loads with one or two of the three nozzles operating.

• **Steam plant problems**—Steam plant construction has dominated P G. & E.'s postwar work. On this, W. L. Dickey, chief civil engineer, power division, Bechtel Corp., pointed out one innovation—the use of rigid frame boxes instead of flat mats for turbine bay foundations. Result is a substantially thinner slab, and the opportunity to use the compartments of the box for handling cooling water supply, discharge and storage.

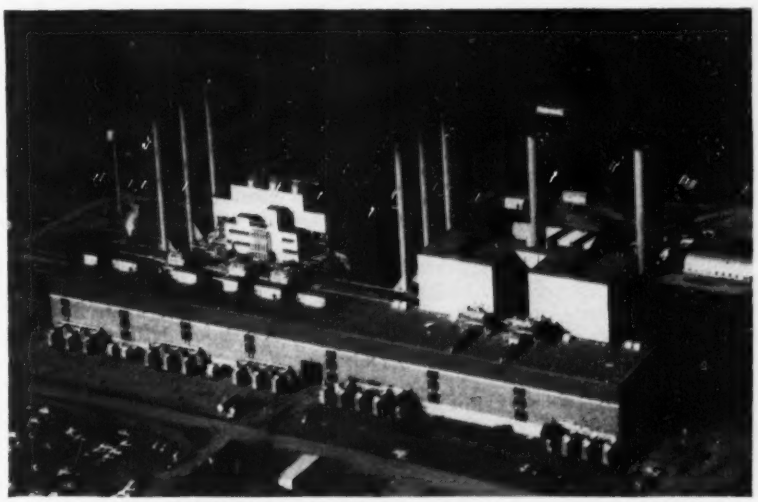
The most unusual construction problem at the steam plants built by Bechtel Corp., according to E. J. Garbarini, general construction superintendent, was the installation of a cooling water intake composed of twin, 12-ft dia tubes 400 ft long. The tubes were cast on shore in 100-ft units weighing 480 tons each, fitted with bulkheads, skidded out over the river, lowered by overhead rigging, floated into position and sunk on prepared foundations.

Other papers dealing with the P. G. & E. work covered underwater precast-concrete transmission tower foundations by Ben C. Gerwick, Jr., Ben C. Gerwick, Inc.; surge chambers by J. D. Worthington, senior engineer, P. G. & E.; and fish rescue work at steam plants by James E. Kerr, senior engineer, Bechtel Corp.

• **North bay bridge**—The $62-million Richmond-San Rafael Bridge was discussed in a paper by Norman C. Raab, projects engineer, San Francisco Bay Toll Crossings Division and Ralph A. Tudor, consulting engineer, San Francisco. (Editor's note—Tudor will take office as Undersecretary of Interior some time this month. Construction contracts for the bridge were awarded Feb. 26 after some court delays by proponents of a combination solid fill salt-water barrier and highway crossing.) The bridge was located at the second cheapest spot due to requirements of shipping. An underwater tube was rejected as being too expensive to finance by revenue bonds. Also a fill-crossing, which would require locks and a bridge over them, offered no economy.

B. L. Nishkian, San Francisco consulting engineer, defended the idea of a fill, but said that hydraulic model studies are needed to determine the effect on the tidal bar outside the Golden Gate, and to determine best exact barrier location. Studies are also needed of exact lake level and the location and number of locks.

• **Sewage plants**—San Francisco's new sewage treatment facilities—its $8.5-million North Point and $7-million southeast plants—along with the 15-year-old Richmond-Sunset plant, now provide primary treatment with sufficient chlorination to reduce coliform organisms in shore waters to fewer



PACIFIC GAS & ELECTRIC CO.'S Contra Costa steam plant will have an ultimate capacity of 575,000 kw. Three units—each represented by the twin boilers and stacks on the left—have been in service since 1951. The two remaining units, which will be completed this year, will have one boiler for each. Stacks at the right indicate their location. Main turbine room is in the foreground.

than 10 per milliliter 80% of the time, according to Ben Benas of the city's sewage and waste treatment division. Experiments with peletizing dried sludge are being continued and briquetting is to be studied.

Across the bay, operation of the $23.5-million system of the East Bay Municipal Utility District has practically eliminated the previous unpleasant odor condition along the shore, and this is expected to vanish completely when the remaining sewer outfalls are intercepted, according to Robert C. Kennedy, chief engineer.

• **Earthquake design**—Henry J. Degenkolb, chief engineer for John J. Gould, San Francisco structural engineer, said that the July 21, 1952 earthquake in the Tehachapi, Calif. area "tested" more buildings constructed under the newer building codes than any previous tembler. His study of the effects led him to conclude:

1—Instead of a blanket requirement for high earthquake coefficients, modest coefficients—resulting in construction savings—are adequate where only the protection of the public is involved and the particular structure is inherently flexible;

2—It may be sound economy to provide a rigid bracing system—with high earthquake coefficients—where expensive finishes or rigid interior partitions must be protected;

3—The producing of safe and adequate earthquake-resistant structures for the public basically must lie with the experience, knowledge and judgment of the designing engineer rather than with detailed building codes.

• **Defense spending**—Optimism prevailed in examining the problem of the effect on construction to be expected when defense-construction spending is reduced. Noting that expenditure for construction is only a small portion of the total amount projected for defense activities, James I. Ballard, of WESTERN CONSTRUCTION, said the time to worry will come when over-all defense spending stops. Activity in construction correlates with the gross national product, which is likely to continue to be large as long as the present unsettled world situation—and therefore defense spending—exists.

Hugh Abernathy, of Prudential Life Insurance Co., Los Angeles, emphasized the importance of fiscal policies of the government. These will probably cause short-term money rates to fall and long-term money rates to rise, as the federal budget is balanced and the government begins to do more of its financing by long-term borrowing. However, R. F. Boger, publisher of ENGINEERING NEWS-RECORD, in a discussion from the floor pointed out that the recent liberalization of margin limitations for stock market transactions from 25% to 50% should counteract this trend by placing an increased demand on short-term money.

Changes in government policy were also discussed by A. E. Poole, president, the Hallen Co., New York, who noted a trend toward greater private ownership of industrial facilities now belonging to the government.

J. Perry Yates, vice-president, Bechtel Corp., San Francisco, predicted a high level of construction activity for at least four years. He noted as factors, in addition to population pressures, the need to increase our facilities for the extraction of natural resources. Further, he predicted that U.S. construction firms will broaden their foreign activities, consistent with this nation's expanding leadership in world affairs.

• **Airports for jet planes**—Factors that engineers must take into consideration in designing for jet-propelled planes were outlined for the Air Transport Division by John G. Gorger, chief project engineer of Pan American World Airways.

Planes weighing from 50% to 100% more than those now in service can be expected although over-all dimensions of jet planes will not be much greater. Runways will need to be stronger but hangars that can accommodate wing spans of 140 ft and tail heights of 40 ft probably will be adequate for jets. On the other hand, fuel handling facilities at existing airports probably will need to be doubled, and in cold climates facilities for heating fuel also may be needed.

In discussion Raymond D. Kelly of United Air Lines said that the jet plane dimensions they have set for their designers are higher than those given by Mr. Gorger. They call for hangar openings of 160-ft span and tail heights of 50 ft.

• **Pavements for jet planes**—Two of the papers presented at the Air Transport Division meeting created a widespread impression that the Army Engineers are less concerned over possible damage to pavements resulting from the operation of jet planes than are engineers of the Bureau of Yards and Docks. That was due to the fact that studies reported by Gayle McFadden, chief of the airfield branch, Office of the Chief of Engineers, related to present jet aircraft, whereas the studies reported by J. A. Bishop, director of the soils and pavement division of the Naval Civil Engineering Research Laboratory at Port Hueneme related to much higher jet temperatures that may be encountered with jet engines in the future. The maximum pavement temperature found in the Army tests was 385 deg, while temperatures close to 800 deg were recorded in the Navy test studies.

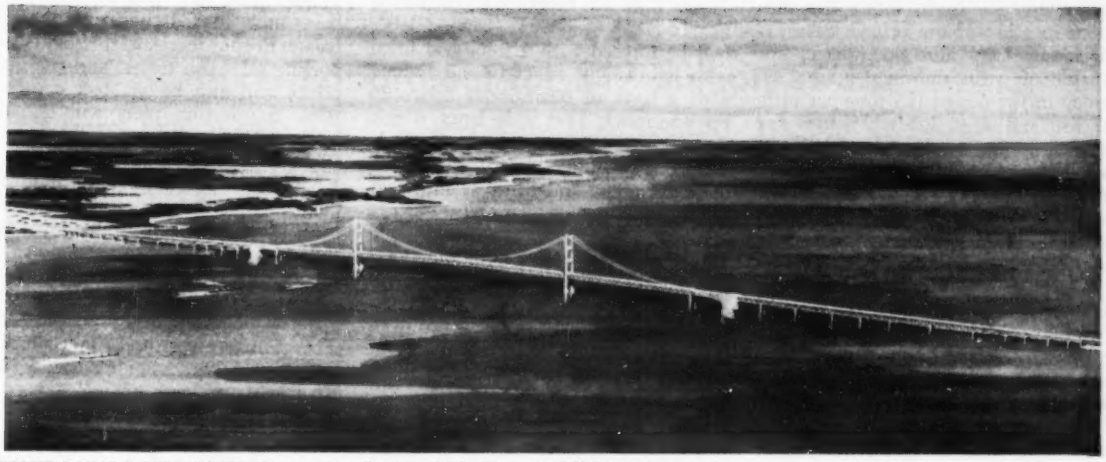
The Army Engineers concluded from their studies that portland-cement concrete pavements are not affected by jet aircraft except for damage due to joint-sealing materials. They also found that "well-designed and well-constructed, dense-graded, hot-mix asphaltic concrete pavements resist satisfactorily both heat and blast and the fuel spillage of most airplanes under normal operating conditions."

The Navy agrees as to portland-cement concrete but did not find that even a properly compacted asphaltic concrete stood up satisfactorily under the more severe blast conditions used in their tests.

Both services are in agreement that no thin surface treatment yet developed can protect an asphaltic pavement from damage from jet planes in take-off or maintenance areas. Both services are continuing their studies. These include protective layers of prestressed concrete pavement, ceramic materials, and plastics.

• **Bridge design**—Highway bridges were the subject of one session of the structural division. Norman Raab, projects engineer for the Division of San Francisco Bay Crossings, told of studies that indicate that heavy loadings become less significant as bridge span lengths increase. Observations were made on the lower deck of the San Francisco-Oakland Bay Bridge, during the passage of a heavy military convoy.

AASHO specifications of standard wind loadings need revision where they refer to overturning moments, according to George S. Vincent, USBPR bridge engineer at Seattle, Wash. Describing windtunnel tests on three types of span models, he noted that present AASHO wind-load criteria for transverse and longitudinal stresses are substantially valid, but that the overturning force should be 20 lb per sq ft of plan area concentrated upward at the leading quarter point of transverse section. The same force, concentrated downward at the trailing quarter point must also be included. There is a greater wind force on truss spans than on girders, because the wind force strikes both trusses, whereas the leading girder acts as a windbreak. An open deck increases the total wind loading because it gives the wind more opportunity to strike the trailing structural member.



THREE-MILE LONG BRIDGE over the Straits of Mackinac in Michigan incorporates a near-record 3,800-ft suspension span.

Record high contracts let for Mackinac bridge project

Start of work is contingent on $96-million bond issue; suspension span will be world's second longest

Largest contracts ever let for bridge construction have been awarded for the Mackinac Straits Bridge to bring one step closer to realization the dream of bridging the straits between the upper and lower Michigan peninsulas. Financing arrangements are still to be completed.

Two contracts have been awarded by the Mackinac Bridge Authority totaling $66 million. Merritt-Chapman & Scott Corp., of New York City, received a $24.5-million contract for substructure work, and the American Bridge Division of the United States Steel Corp., a $41.5-million contract for the steel superstructure.

The bridge was designed by David B. Steinman, consulting engineer, New York City, with Glenn B. Woodruff, of San Francisco, as consultant.

• **Work included in contracts**—Substructure work involves construction of 34 piers varying in depth from 50 to 200 ft below water level. The superstructure contract includes fabrication and construction of 9,304 ft of truss spans and an 8,614-ft suspension bridge.

Between anchorages, this suspension bridge will be the longest in the world. Designed to be unusually stable aerodynamically, it will have a main span 3,800 ft long, second in length only to the 4,200-ft Golden Gate Bridge main span at San Francisco, Calif.

In addition to the work already under contract, there will be 8,267 ft of approach roads and viaducts in the project. Mr. Steinman estimates that the entire cost of construction will be $78 million, exclusive of financing charges and interest during construction.

• **Financing being arranged**—Both contracts awarded are contingent upon successful completion of financing. Bids will be taken by the Mackinac Bridge Authority by April 1 for a $96-million bond issue, which will be backed by revenue from tolls. B. J. Van Ingen & Co., of New York City, has been acting as financial adviser to the authority. It has formed a nationwide syndicate of about 160 financial firms and is prepared to underwrite the issue. (ENR Jan. 22, p. 81)

TWO PENINSULAS into which the Straits of Mackinac divide Michigan will be linked by the new bridge.

Prentiss M. Brown, chairman of the authority, predicts the interest rate on the tax-exempt bonds will be between 3.75 and 4%. They will have a maturity date of Jan. 1, 1993, but traffic and revenue studies made by Coverdale & Colpitts, of New York City, indicate the bonds can be retired by 1980.

Tolls are expected to average about $2.60 per vehicle. A passenger car plus driver will be charged $2, additional passengers $0.25 each.

• **Ferries proved inadequate**—Need for a bridge over the Straits of Mackinac, a slow-flowing body of water between Lakes Michigan and Huron, long has been recognized. The straits separate the Upper Peninsula of Michigan, famed for its mineral resources and recreational areas, from the highly industrialized Lower Peninsula. The new bridge not only will provide a badly needed link between these two areas but, with a crossing over St. Mary's River at Sault Ste. Marie, a direct connection with the Province of Ontario.

The bridge will replace existing ferries that have been owned and operated by the Michigan State Highway Department since 1923. They have been losing $800,000 annually. In addition, present crossing time—53 min—plus waiting time make the ferries a bottleneck. Waiting time ranges from 1½ hours in the fall and winter to a peak of 17 hours in the hunting season. The bridge is expected to cut crossing time to 10 min.

• **How bridge type was chosen**—The geologists reported that rock strata

underlying the straits along the proposed location of the bridge, between Mackinaw City and St. Ignace, are capable of withstanding pressures assumed in the design (15 tons per sq ft for live and dead loads, 25 tons for other loading combinations). However, there is a hidden deep rock gorge under the channel.

To bridge it, a span of 3,800 ft was decided upon, with main piers founded on rock about 200 ft below lake level. For shorter spans, the piers become excessively deep and expensive, Mr. Steinman reports. The only feasible type of structure for spanning the gorge is a suspension bridge, he concluded.

For economy, he chose side spans of 1,800 ft, with 470-ft unloaded backstays. This design permits anchorages for the cables to be placed where suitable rock formations are found at moderate depths—70 and 85 ft.

Trusses with spans of 330 to 560 ft will be used for 20 spans over the deep portions of the waterway. Four spans near each shore will range from 160 to 200 ft. These lengths were determined by the cost of deep and massive piers required to withstand ice pressure (115,000 lb per lin ft of pier width).

• **Lightweight deck**—Designed for a live load of 2,000 lb per lin ft (H20-S16 trucks spaced 50 ft apart on four lanes), the bridge will carry two lanes of traffic in each direction, separated by a low, 2-ft wide mall. The roadway will be 48 ft wide between curbs, and footwalks 3 ft wide along both sides will bring the total width between railings to 54 ft, according to the plans.

The deck was designed to keep dead load down. Outer, 12-ft wide lanes will be formed with a steel grid filled with lightweight concrete and topped with a layer of bituminous concrete. For the inner, 11-ft wide lanes, which are expected to carry heavy traffic only during peak hours, an open-grating floor, weighing one-third as much as the solid deck, will be used.

The roadway has a maximum grade of 2.5%. This is ample to provide a minimum clear height above mean lake level of 135 ft for a width of 3,000 ft over the main channel. Minimum clear height at the center of the main span will be 148 ft.

• **Cable sag is small**—This span will be suspended from two 24.25-in. dia, 37-strand cables 68 ft apart. Each strand will be composed of 348 galvanized 0.196-in. dia wires—a total of 12,876 per cable. The cable sag of 350 ft, about one-eleventh the center span, will be less than for some other suspension bridges, but Mr. Steinman believes it will make the structure appear more graceful and will add to the stiffness of the structure.

Anchorages are designed for a total pull from the two cables of 30,000 tons. They will each contain 85,000 cu yd of concrete.

Suspenders, spaced 40 ft apart, will be standard 2¼-in. dia wire ropes looped over and resting on steel cable bands clamped to the cables. Socketed ends of the ropes will be attached to the top chords of stiffening trusses.

The towers will rise to a height 552 ft above lake level. Of cellular steel construction, with a service elevator in one shaft, they will be fixed at the base and braced horizontally with trusses at four levels. Cable-bents supporting side-span trusses and the main cables will also be of steel construction. Supporting piers will be concrete.

• **Most stable section**—Mr. Steinman believes that the bridge will have the most aerodynamically stable cross section ever built for a suspension bridge. His reasons are:

1. The stiffening trusses will have a depth of 38 ft, or 1/100 the span. This ratio is the same as that adopted for the 3,600-ft span of the Severn River Bridge in England and compares favorably with that for the 4,200-ft span of the Golden Gate Bridge (1/168) and the 2,150-ft span of the Delaware Memorial Bridge (1/107.5).

2. Transverse floorbeams are designed as trusses rather than solid-web girders, to minimize wind pressure.

3. Lateral trusses will be provided both in the plane of the top chords and bottom chords of the stiffening trusses. These will increase torsional rigidity substantially compared with the single system that has been commonly employed for suspension bridges until recently.

4. Open spaces will be left between the roadway and stiffening trusses. These openings, together with the 24 ft of open-grating floor at the center of the roadway and the open-web floorbeams, assure aerodynamic stability.

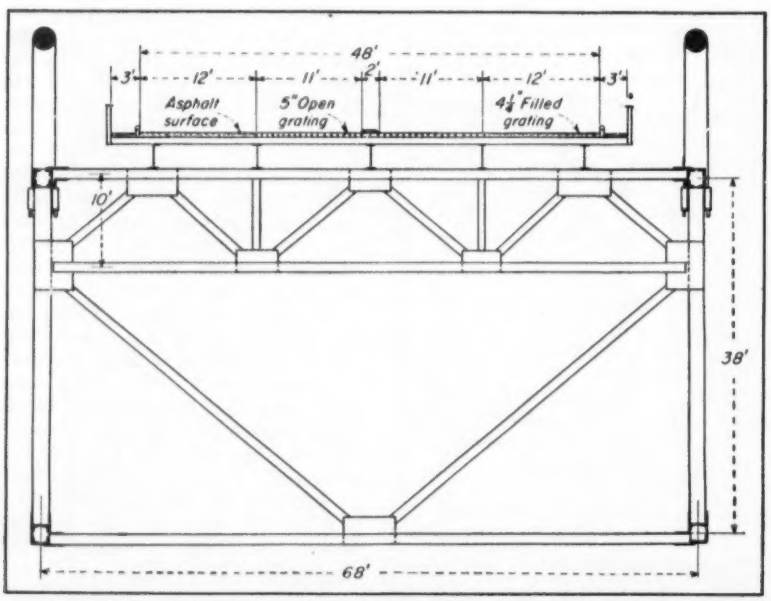
The bridge was designed for a static wind pressure of 50 psf of exposed area. This corresponds to a wind velocity of about 120 mph, as compared with a maximum velocity of 78 mph recorded in that vicinity.

Assuming that funds will be available, construction may start this spring. The bridge is expected to be open to traffic by Nov. 1, 1956.

In 1934, a Mackinac Straits Bridge Authority was created by the state legislature. Its engineers advanced several plans for a crossing and applied to the Public Works Administration for financing. The applications were turned down.

In 1938, the authority engaged Modjeski & Masters, consulting engineers, who recommended a bridge extending almost due north across the straits from a point at which highways U. S. 31 and U. S. 23 converge on the south shore. Before this could be acted upon, World War II intervened.

Ten years later, the present Mackinac Bridge Authority was created. It appointed a board of three consulting engineers—O. H. Ammann, D. B. Steinman and G. B. Woodruff—to determine the feasibility of a bridge across the straits.



SUSPENDED STRUCTURE will have high aerodynamic stability because of openings in floorbeams and roadway and between roadway and stiffening trusses.

Tunneling mark set

A fourth world's record has been set by miners working on the 10-mi power tunnel through Portal Mountain between the Kemano power-house site and Lake Tahtsa in Aluminum Co. of Canada's giant aluminum project in northern British Columbia (ENR Sept. 25, 1952, p. 32).

Morrison-Knudsen officials have announced that tunnel gangs pushed the 25-ft dia tunnel 282 ft in six days during mid-February, breaking their own previous records on the job.

Rival Pacific Northwest pipeline plans heard

The battle for federal approval to bring natural gas into the Pacific Northwest—a project that might mean up to $190 million in construction—appears to be becoming just a bitter struggle between two pipeline companies.

As hearings resumed last week before a Federal Power Commission examiner, four competitors for the rich market were still making the race. But on the record made thus far, it appeared the nod would go either to West Coast Transmission Co. or Pacific Northwest Pipeline Corp. Both have their papers in order to show they can deliver the gas if and when FPC gives the go-ahead signal.

For the construction industry, bringing natural gas to the area will mean laying some 1,400 to 1,700 mi of main transmission line either wholly within the U. S. or both in the U. S. and Canada. Cost of this initial construction would be somewhere between $110 million and $190 million, depending on the source of supply.

Right now it looks as though the company that wins this market all to itself is the one that can prove to FPC in Washington that it has more and better reserves of gas available up for guaranteed future delivery.

West Coast and its parent company, West Coast, Ltd., both Canadian-owned, would draw on Canadian fields in northern Alberta and British Columbia to bring gas to the big Northwest cities. Its proposed system would include some 960 mi of main line and related facilities on both sides of the border to be built at an estimated cost of $111 million.

Pacific Northwest would bring gas up from the San Juan Basin in the "Four Corners" area where the states of New Mexico, Colorado, Utah and Arizona come together. Its 1,700 mi of main lines, laterals and other necessary facilities would cost an estimated $186 million.

Army unfreezes Gavins Point Dam project for $17-million award

Secretary of the Army Robert T. Stevens last week granted special approval for the award of a $17.5-million Gavins Point Dam contract.

Bids had been taken before the freeze went into effect. The Secretary cleared the job to permit signing a contract before the 30-day awarding period expired.

The big bid covers powerhouse foundations, spillway and intake structures, and Phase 2 of the earthwork for the $60-million project. Congress gave the Corps of Engineers $7 million to carry on the job in the current fiscal year, following $2 million last year. The Truman budget asked $17 million for the year starting July 1.

No similar special action has been taken on any other big job, the Army Engineers say. Special approval of the Gavins Point award sets no precedent for other major contracts.

Contractors receiving the $17.5-million contract are Massman Construction Co., of Kansas City, Mo.; J. A. Jones Construction Co., Charlotte, N. C., and Western Construction Corp. of Sioux City, Iowa.

Army Engineers in the area were interpreting Washington's action in taking the Gavins Point Dam project out of the deep freeze as an indication that the Administration would go along with the program of Missouri Basin development. There was, however, no comment out of Washington to that effect.

District Army Engineers felt that if a curtailment of the program were in view, Gavins Point would be most likely to have gotten the ax. The dam was begun only last year and could have been scrapped with a smaller loss than most projects.

Compromise solution on Incodel sought

Gov. John S. Fine, presumably taking heed of sharp criticism voiced in the Pennsylvania legislature and elsewhere, made it clear last week that the Incodel Plan has not been eliminated completely from consideration.

The governor said that soon he would call together members of Incodel and the state's special water resources committee (which made the report opposing the plan) and also their engineers. This would be done with the hope that the opposing engineering conclusions in some way might be reconciled.

Although he had indicated previously that he stood behind the report opposing the Incodel compact (ENR Feb. 19, p. 48), Gov. Fine declared: "I have not rejected the idea of a compromise if it appears to be in the best interests of Pennsylvania."

This was the governor's first official recognition of the sharp criticism of the water resources committee report submitted to him Feb. 8 by a group headed by Albert M. Greenfield, Philadelphia realtor.

Meanwhile, State Senator Montgomery F. Crowe (R., Monroe) said last week he is considering the idea of asking for a legislative study of the rival Incodel and Pennsylvania water resources committee engineering reports.

North Atlantic states highway officials meet

G. Albert Hill, Connecticut State Highway Commissioner, was elected president of the Association of Highway Officials of the North Atlantic States at its 29th annual convention in Atlantic City last week.

Other officers elected at the three-day session were John N. Robertson, highway director for the District of Columbia, vice-president, and A. Lee Grover, secretary of the New Jersey Highway Department, secretary-treasurer.

The convention passed a resolution urging that federal aid funds "be made available for payment of principal on bonds sold for construction of toll facilities." The highway officials also took a stand against any further federal automotive taxation and for return of existing federal motor tax receipts to the states for highway expenditures.

More funds requested for Eklutna project

Interior Secretary Douglas McKay in a letter to Congress last week endorsed the Eklutna reclamation project in Alaska (ENR Sept. 11, 1952, p. 35), including the draft of a proposed bill calling for an open-ended authorization for continuing construction.

Meantime, the House Interior Committee held a one-day hearing on a bill introduced by Rep. R. L. Bartlett of Alaska, which would raise the authorization limitation on the project from $20.3 million to $35 million. A second hearing was scheduled for March 13, at which Bureau of Reclamation officials have been asked to provide information on the additional work required.

ASCE sanitary engineers meet to consider AASE

The as-yet unborn American Institute of Sanitary Engineers (ENR Feb. 12, p. 28), recently rechristened American Academy of Sanitary Engineers (ENR Mar. 5, p. 124), was cause for an extraordinary meeting in Chicago of ASCE's sanitary engineering division executive committee late last month.

The special session was attended by AASE proponents—Rolf Eliassen, H. F. Ludwig, and Lt. Col. A. F. Meyer, Jr.—as well as by representatives of the American Water Works Association, Federation of Sewage and Industrial Wastes Association, American Public Health Association and the Joint Committee for the Advancement of Sanitary Engineering.

Hearing objectives of the proposed new "academy," the majority expressed strong feelings that establishment of another organization—in a field already crowded with splintered groups—should be thoroughly explored by the Joint Committee for the Advancement of Sanitary Engineering, which is to meet in July.

Meantime, the canvass of 500 sanitary engineers for their ideas on the need for a new organization has not been carried out.

It originally had been reported in ENR Feb. 12 as under way but that story was based on a second draft of the proponents' proposal to establish the new organization. A third draft has been written since with a change in procedure.

Prof. Eliassen told ENR last week, "We definitely are not planning to go ahead as far as canvassing any members is concerned."

Committee members who attended the Chicago meeting were H. B. Gotaas, B. A. Poole, Rolf Eliassen, Ralph Fuhrman, R. J. Morton and J. C. Bumstead. Don P. Reynolds represented the ASCE staff; H. H. Gerstein, the AWWA; W. H. Wisely, the FS&IWA; Frank Elder, the APHA; Prof. Ernest Boyce, the Joint Committee.

Oahe Dam threat fails as N. D. legislators adjourn

A major threat to the Army Engineers' Oahe Dam near Pierre, S. D., petered out last week when the North Dakota Legislature adjourned, leaving pigeon-holed a memorandum calling on Congress to halt construction funds for the project.

Oahe, which is approximately 5% complete, will cost $285 million. The Truman budget recommended an appropriation of $14.8 million for the project.

Thomas H. MacDonald sets retirement date

Public Roads Commissioner Thomas H. MacDonald has advanced the date for his retirement to April 1.

Best bet last weekend for his successor appeared to be Francis V. du Pont, member and chairman of the Delaware State Highway Commission from 1922 to 1950.

Du Pont is 58 years old. MacDonald, who will be 72 in July, is serving under executive extension beyond statutory-retirement age. The commissioner moved up his date for leaving without any pressure from the administration.

In Delaware, du Pont is looked upon as the father of the Good Roads program. His father, U. S. Senator T. Coleman du Pont, had been a leader in the movement. As one of his last great efforts while commission chairman, Francis du Pont is given primary credit for the construction of the Delaware Memorial Bridge.

His appointment has the approval of Commerce Secretary Sinclair Weeks and Undersecretary for Transportation Robert Blaine Murray, Jr.

The Bureau of Public Roads is a monument to MacDonald. He has headed the organization in all its phases for 34 years since Congress created the federal agency.

North Platte irrigation and power plan drawn

A plan-report for a proposed $50-million power and water resources project on the North Platte River in Wyoming has been submitted to the governors of Wyoming, Colorado and Nebraska by Avery A. Batson, director of the Bureau of Reclamation's Region 7 at Denver.

The scheme involves construction of Glendo Dam, reservoir and power plant on the North Platte near Glendo, Wyo., and Fremont Canyon power plant at the backwaters of the Alcova Reservoir southwest of Casper, Wyo. The reservoir at Glendo Dam, with an operating capacity of 800,000 acre-ft, would make 15,000 acre-ft of irrigation water available annually for use on lands in Wyoming and 25,000 acre-ft for Nebraska farmlands.

The two proposed power plants, generating 306,000,000 kilowatt hours annually, would provide an 80% increase in the power output of the North Platte River power system.

Agreement of Colorado, Wyoming and Nebraska on a proposed stipulation to a 1945 Supreme Court decree regulating use of North Platte waters cleared the way for completion of the plan-report now being studied by the governors of the three states. If Congress votes funds, construction could begin in 1955.

Connecticut authorized to build thruway

A Connecticut Superior Court judge has ruled that State Highway Commissioner G. Albert Hill has authority to construct the proposed Fairfield County $120-million thruway as a relocation of U. S. Route 1.

Judge John M. Conley held that the commissioner's right to build the thruway is derived from what is known as the "relocation" statute. "U.S. Route 1 is outmoded, outdated and far below the present recognized standards for construction of highways bearing similar loads," the court declared. "The condition has reached a point where public safety and public welfare imperatively demand an immediate remedy," the decision said.

Counsel for the Citizens Association of Connecticut, one of the plaintiffs in the action challenging Commissioner Hill's power to build the thruway, indicated that an appeal probably would be made to the State Supreme Court. Other complainants in the action included the Stamford Thruway Relocation Council Inc. of Stamford and 100 private citizens of Fairfield County.

The plaintiffs had contended in part that Commissioner Hill is building a new road under guise of relocating Route 1. They also challenged his authority to proceed with the work until funds needed to complete the entire project have been appropriated by the General Assembly.

Declaring there is a "practical and urgent" need for judicial determination of the commissioner's power, Judge Conley emphasized the issue before the court was narrowed to this point and that it is up to the legislature to act on the broader questions such as the necessity for the highway, whether or not it imposes a hardship or represents an extravagant use of public funds.

Meantime, a legislative committee which will consider the thruway project is now making an inspection trip of the proposed route. "There has been so much controversy over the project that our members feel they should make a personal inspection of the area," declared Rep. Lawrence M. Gilman, committee chairman.

The thruway, for which the legislature is asked to approve a $60-million bond issue to permit start of construction, would skirt the shoreline between West Haven and New York.

Meany testimony bares industry split

Conflicting testimony from all sides may stall congressional action on Taft-Hartley law this session

Disagreement on how to amend the Taft-Hartley labor law is wider than anybody had thought, particularly on the closed shop and secondary-boycott issues which plague the construction industry. It looks more and more as if Congress may not do anything about the law this session.

Testimony before the House Labor Committee was a good example of how far apart labor and management really are:

- AFL President George Meany called for a restoration of the closed shop and a virtual repeal of the Taft-Hartley law.
- The National Association of Manufacturers' spokesman George W. Armstrong, Jr., president of Texas Steel Co., went in the other direction, asking for stronger union curbs, prohibition of any form of compulsory union membership and opposing even the balancing amendment offered by Sen. Robert A. Taft, the law's co-author.

They testified as the National Labor Relations Board was issuing five decisions against contractors and AFL building trades unions, including Labor Secretary Martin Durkin's plumbers, charging closed-shop tactics.

Fuel will be added to the fire when the construction industry and CIO President Walter P. Reuther present their views on Capitol Hill. Some AGC chapters are preparing testimony opposing the Taft amendment making concessions to construction hiring practices. Whether AGC itself will testify will be decided at Miami meetings in the week of March 23. (Labor Committee is scheduled to meet beforehand.)

Sharpness of the labor-management differences was also apparent in the inability of the Labor Dept.'s tripartite advisory committee to make any progress toward agreement on T-H amendments.

• AFL view—Meany told the House committee that the T-H union shop has been "meaningless" in the construction industry because the 30-day waiting period keeps the union from reaching casual workers (Taft would reduce the waiting period to seven days). He asked that Congress restore the closed shop "as a matter of right and equity," and that it kill the provision in Taft-Hartley which gives precedence to restrictive union security laws in some 16 states.

GEORGE MEANY, president of AFL, proposed many changes in the T-H law.

Meany attacked the secondary-boycott ban and other T-H restrictions which he said hampered "mutual assistance" between unions in protecting themselves "against struck work, sub-standard work or employment-displacing work."

The secondary-boycott ban, he said, should be narrowed by making it necessary to prove that the illegal objective was the "principal" objective of a union tactic. The law now refers to "any" objective.

Subcontractors, in Meany's view, should not be considered "neutrals" in a dispute between a union and a prime contractor. The sub and prime contractors have a joint interest in a construction project and should be regarded as one employer, he argued. Any such interpretation would, it is believed, undermine seriously the effectiveness of the secondary-boycott curb on construction.

On jurisdictional disputes, Meany asked only for clarification. He said that as now written the law makes some economic or organizational strikes appear to be jurisdictional disputes. Incidentally, Robert N. Denham, former NLRB general counsel, praised the work of the National Joint Board for Settling Jurisdictional Disputes in the Construction Industry. He suggested such a board for all jurisdictional disputes in any industry. Meany would remove from the law all injunctions, suits against unions for damages and breach of contract, the curb on featherbedding, restrictions on political spending, and health and welfare funds.

Meany testified for the whole AFL, including the building trades.

Stiff anti-union measures introduced in two states

Drastic anti-union measures, introduced in the state legislatures of both Colorado and Idaho last week, are facing stiff opposition.

In Colorado the issue brought a split between Governor Dan Thornton and his party's floor leader in the state senate. Initiated by Republican Majority Leader Frank L. Gill, the measure would outlaw union and closed shops, restrict picketing and prevent unions from using any type of "coercion" to gain members.

The bill introduced in the Idaho Senate by the Industry and Labor Committee would forbid a union from seeking a closed shop, and carries provisions for enforcement by court restraints and injunctions.

Fred A. McCabe, chairman of the legislative committee of the Idaho State Federation of Labor, charged that the bill is a product of out-of-state management, and said his organization will fight it vigorously.

"Featherbedding" explained

In testifying before the House Labor Committee, Meany said concerning featherbedding:

"There has been a great deal of misinformation and misunderstanding of this problem. I am convinced that if Congress took a closer look at this problem and consulted the unions concerned, it would agree that virtually all of the practices sometimes condemned as restrictive actually are rooted in the practical experience of the trade or occupation in question. Such provisions in the agreements with employers are usually no more than legitimate safeguards necessary to protect the health, safety, proper standards and the job opportunities of the workers concerned, as well as public safety. We, therefore, urge that this provision in the law be eliminated."

Unions get set for spring bargaining

Early indications are that most trades will ask 25 cents and probably settle for 15 cents plus fringe benefits

Surveying key points around the country, ENGINEERING NEWS-RECORD has observed an early trend in the coming wage bargaining sessions of this spring. Indications are that:

- Unions will ask for about 25 cents per hour raise in wages.
- Many unions will settle for 15 cents per hour, if they must.
- Some unions are eager for fringe benefits and will bargain for them.
- Some want cash in the pay envelope and will defer benefits.

Starting with the Far West:

In San Francisco major trade-contract negotiations for the five basic trades—carpenters, laborers, teamsters, operating engineers and cement masons—are opening within 30 days.

No demands have been made yet—except the demand for the initial meeting. The secretary of the Building Trades Council would not prophesy as to the probable demands. He said the unions would have to find out how the end of controls is going to affect the cost of living.

While health and welfare demands certainly will be made, the BTC says the unions will take cash in hand if there has to be a choice.

But some indication of actual money can be gotten from the painters, who asked for 25-cent increases, have been offered 15 cents, and have sent out a referendum vote.

• Southern California—Opening proposals and counterproposals already have been made in building trades negotiations in 12 Southern California counties.

Proposals by unions, all of which this year are negotiating separately instead of jointly as in the past, are typified by those of the teamsters, who want 25 cents. In addition, all unions asked for various adjustments in rates and categories—plus fringe benefits.

Counterproposals by contractors were for wage reductions of exactly the same amount as the increase proposed by the unions. And, as last year, the contractors (represented by AGC and BCA) refuse to consider fringe benefits. An AGC spokesman said he thinks unions proposed fringe benefits as bargaining points only.

Now across the country to Chicago:

Chicago building trades unions are now negotiating with the Building Construction Employers Assn. A labor spokesman said unions were asking 15 cents an hour over the scale prior to the day when wage ceilings were removed. An employers' spokesman said demands are ranging from 2½ to 30 cents an hour.

In the first settlement to come out of the negotiations, averting a strike of 4,000 plumbers, the agreement pledged the contractors to pay 15 cents an hour into an employees' pension fund.

Independent reports say that unions are demanding 15-cent increases or, as an alternative, employer-paid pensions.

If they have a choice, however, union negotiators will take cash instead of fringe benefits, according to a union spokesman.

Special consideration

AFL construction unions in Pittsburgh, alarmed by current unemployment compensation practices in Pennsylvania, are reported ready to carry their protests to the state capital.

A delegation from the AFL Pittsburgh Building and Construction Trades Council recently visited Alfred C. Scott, district manager of the Pennsylvania State Employment Service. The delegates protested the job availability requirements and other issues—including delays in getting jobless insurance checks.

One of the issues is a reported practice of sending out-of-work skilled craftsmen to non-union jobs.

The delegation told Scott that such a craftsman faces loss of union membership and such benefits as seniority, pensions and life insurance.

Scott said that under a Supreme Court ruling, the union's availability status cannot be considered. The union leaders emphasized that construction work has peculiar features: Workers change contractor employers as many as eight or nine times a year; weather conditions are an important factor; and seasonal lack of work is common.

The delegation suggested that jobless pay requirements take the special conditions of the construction industry into consideration.

• Ohio picture—Practically all major building-trades contracts in Cleveland expire next year, but most have agreements to reopen wage talks on April 1, 1953.

In early February four building trades presented demands to employers for a wage increase of 25 cents an hour plus a 7½-cent request for health and welfare (ENR Feb. 26, p. 29). Employers considered the demands and came back this week with an offer of 7½ cents an hour, either as a wage boost or as welfare.

The unions, except for plasterers and operating engineers, turned down the offer but both groups have agreed to discuss the matter further. Indications are that the unions will take 12½ cents an hour increase, preferring cash to welfare benefits.

• Pittsburgh trend—In the Pittsburgh, Pa., area most contracts expire around June 1. Many contracts, however, have already expired. In these instances, the unions generally have won wage increases averaging 15 cents an hour plus 7½ cents for welfare and insurance funds.

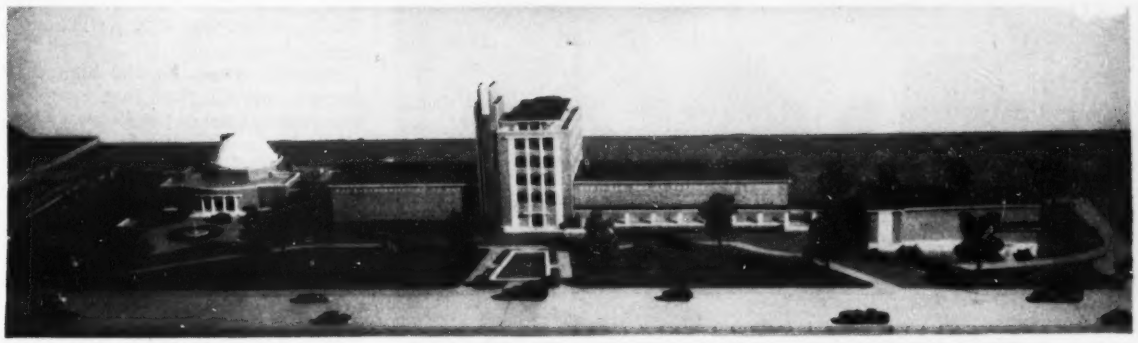
Those two gains are the prime objectives for all unions this year. Unions do not appear disposed to discard either of them as bargaining weapons.

There is a probability that the union members themselves might choose the welfare fund if forced to pick. Union leaders say there is a lot of enthusiasm for the fund.

• St. Louis unsettled—In the St. Louis, Mo. area only the laborers have made a definite opening demand. They want 15 cents an hour wage increase plus welfare benefits of 7½ cents. Their contract expires May 1.

Carpenters and teamsters expect to ask for welfare benefits but have not formulated wage demands—if any.

• Wage increase round-up—Wage increases of 9 to 13 cents an hour have been granted more than 5,000 building tradesmen in eastern Washington and northern Idaho, under a new contract between the unions and building contractors. . . . Pay increases amounting to 25 cents an hour for 12,000 carpenters, employed in building, heavy construction and highway work in Oregon and southwest Washington have been settled in contracts signed in that area. . . . The General Contractors Ass'n., of Hawaii, has recommended that its 200 members boost pay of their 7,000 workers. The increases recommended scale from 5 to 13 cents.



SCIENCE PARK in Boston, Mass., when completed, will include a planetarium (left), museum (center) and aquarium.

Museum and planetarium built on old dam

SCIENCE PARK in Boston, Mass., is taking shape on top of 45-year old Charles River Dam, an earthfill structure with a timber core. On this site will be built a museum, a planetarium and an aquarium, according to present plans. As might be expected, the buildings have to be supported on piles.

Ordinarily, pile foundations would not have presented any unusual problems for the first two interconnected buildings to be constructed. But conditions encountered turned out not to be ordinary.

The dam, about 1,200 ft long, extends from Boston to Cambridge. On top, it is 350 to 500 ft wide. This area, formerly a rarely used park, contains a street-car viaduct and a highway, as well as the museum site.

• **Long piles support museum**—First building to be constructed was the 2½-story, 70 x 137-ft east wing of the museum and part of a 6-story central tower at one end of the wing. Ultimately, the tower will house the administrative offices, library, and a Hall of Man and Public Health. The east wing is intended for a Hall of Nature.

The east wing is located so that only part of the building could be supported on the crust. This raised the question: Would it be wise to found the structure both on the crust and on the hardpan, 75 ft below grade? Because of the possibility of objectionable differential settlements, the designers decided against piles supported on two different strata. Instead, they called for step-tapered, cast-in-place concrete piles driven to hardpan under the entire east wing.

• **Wood piles carry new wing**—After this building was completed funds for the irregularly shaped, 110 x 120-ft planetarium wing became available. But when the time came for foundation work to start, steel shells for the long piles were not available.

Since the crust is continuous under this wing, the designers decided to support the building on relatively short wood piles, driven only to the crust. Then, to minimize differential settlements between the two wings, they incorporated a slip joint, making the buildings structurally independent.

• **Design features flexibility**—The east wing is also of interest because it provides large unobstructed floor areas and flexible heating, plumbing, and electrical wiring to meet the needs of the ever-changing display program. During the design stage, it was impossible to predict how large or how heavy some of the exhibits might be, or whether portions of the floors might have to be removed temporarily to permit the installation of large objects.

Space and flexibility requirements were met by adoption of a structural steel frame for the main portions of the wing and a cellular steel floor deck. Advantage is taken of the hollows in the floor to distribute electrical wiring, thus making electrical service available to any point in the floor.

• **Planetarium design**—The planetarium wing also required large unobstructed floor areas, not only for the planetarium auditorium, but also for a 40 x 78-ft general-purpose auditorium below it.

When the construction work started, structural steel was in short supply.

Thus the lower portion of the planetarium is built as a series of reinforced concrete rigid frames.

The dome is supported on an octagonal frame composed of reinforced concrete girders. This frame rests on concrete columns, preventing the load from bearing on masonry walls surrounding it.

The museum is owned by the Boston Society of Natural History and is directed by Bradford Washburn, who also is supervising the construction program. Ames, Child and Graves are the architects; Robert M. Becker is the structural engineer; George B. H. Macomber Co. is the general contractor for the east wing, and Tredennick-Billings Corp., is the general contractor for the planetarium itself.

PLANETARIUM DOME was built by guniting 2 in. of concrete on wood forms.

CONCRETE PAVEMENT at the North Side Sewage Treatment Works of the Chicago Sanitary District in which fly-ash was substituted for part of the cement.

Experience with fly-ash blends in a test pavement built in 1938

W. T. McClenahan
Principal Construction Engineer
Sanitary District of Chicago

USE OF FLY-ASH as an ingredient of concrete pavements laid by the Sanitary District of Chicago considerably antedates similar use in Baltimore, as reported by W. L. Chilcote in ENR Oct. 23, p. 40. In 1938 the district built about half a mile of experimental road around its North Side Sewage Treatment Works to confirm some findings in its laboratory since 1935, which indicated that fly-ash could be used advantageously in concrete.

At that time we were especially interested in this possible use of fly-ash in concrete because then we had considered burning our sewage sludge at the Southwest Sewage Treatment Works and expected to obtain as much as three carloads of fly-ash a day from that plant alone. We wished to develop a use for this otherwise troublesome by-product of our sewage treatment. However, that plan of sludge disposal has since been abandoned. Nevertheless, we continued to be interested in the use of fly-ash in our concrete for other reasons than by-product disposal.

• **Experimental pavement**—In the experimental pavement which we laid in 1938, we incorporated 47 different mixes. Eight of these, which were used as controls, contained straight portland cement approximating the present Type I portland cement of ASTM C150. The other 39 mixes were made of fly-ash blends of various descriptions.

Considering the fly-ash to be cementitious, the fly-ash in these blends ranged from 18% to 50% by volume of the total cementitious material used, while the cement factor (cement plus fly-ash) ranged from 5.47 to 7.78 sacks per cubic yard for the blend mixes and from 5.42 to 5.6 sacks per cubic yard for the control mixes. The portland cement in the blend mixes ranged from 3.1 to 5.5 sacks per cubic yard. Where the fly-ash amounted to 50% by volume of the total cementitious materials (three mixes), these mixes averaged as follows:

Cement factor (cement plus fly-ash)	6.55 sacks/cu yd
Water cement ratio (cement plus-fly ash)	0.48
Slump	3¾ in.
Strength at 2 days	1,932 psi
Strength at 7 days	3,294 psi
Strength at 14 days	3,780 psi
Strength at 28 days	4,301 psi
Strength at 3 months	4,923 psi
Strength at 6 months	5,607 psi

• **Causes of high early strength**—There are two very good reasons for this high early strength. In the first place, the pavement was laid in the summertime and the cylinders were kept covered in the field beside the pavement for 24 hours before they were taken to the 70-deg. moist room to be further cured until broken.

Another reason for the high early strength was the fact that except in two instances out of the 39 cases where a blend was used, the fly-ash had received a preliminary heat treatment (which we had developed in our laboratory and later patented) which tended to burn out the carbon and seemed to speed up greatly the rate of the pozzolanic action so that greater early strengths were obtainable.

The two mixes which were made with untreated fly-ash verified our previous findings that given time and favorable surroundings the untreated fly-ash will react as a cement quite as satisfactorily as will the treated fly-ash.

• **Results**—Inspection of the pavement this year after 14 years of service under Chicago conditions (including the use of salt upon the more traveled sections) disclosed the following:

(1) The skin coat mostly had disappeared from all of the test sections, although it is more persistent where the cement-plus-fly-ash factor was around 7 or more. The portland-cement factor itself did not seem to make too much difference in the durability in this respect.

(2) Most of the pavement surface now exposes the coarse aggregate to some extent, but there is no raveling of the surface except where there are low spots where water collects and freezes in cold weather.

(3) Only two test sections showed disintegration by D cracking and these two sections both happened to be where straight portland cement had been used. This D cracking is believed to be due to use of too much water in one or two batches of concrete or to water which bled to the surface being screened to a construction joint or corner.

• **Fly-ash in sewer work**—Subsequent to the construction of this experimental pavement, the Sanitary District has continued to use fly-ash in its construction, especially in sewers. Our principal reason for using a fly-ash blend has been that the pozzolan increases the resistance of the cement of the concrete to weak sulfuric acid that forms on the underside of the sewer arch from the oxidation of hydrogen sulfide, which collects in the moisture on the arch surface. While this attack is usually very slow, it is persistent and we like to provide against it as well as we can, for it would be very expensive to rehabilitate a sewer that disintegrates.

For sewer work we have standardized on a blend ratio 1/6 by volume

(75 lb) untreated fly-ash to 5/ (470 lb) of Type II portland cement. (ASTM Type II cement is designed for structures exposed to moderate sulfate action.) This blend has proven to be quite satisfactory in all our work but especially where conditions remain favorable to the hydration of fly-ash.

Consistently we secure strengths in excess of 3,000 psi at 28 days when we use the following to make one cubic yard of concrete:

415 lb	Type II portland cement
72 lb	Untreated fly-ash (carbon not in excess of 1½%
1,340 lb	Natural well graded sand (at least 15% through the No. 50 mesh)
1,995 lb	Well graded gravel (No. 4 to 1½ in. nominal size)
26½ gal	Water (varies slightly)
3½%	Air entrainment

When the sand and gravel are both well graded and properly proportioned as above, we have been able to pump the above mixture as far as 800 ft when the slump was only 1½ in. Not only does the good grading and proportioning make this possible, but the fly-ash also tends to lubricate the mass.

A little air entrainment is considered to be desirable in building sewers and other plant structures exposed to sewage and sewage gas, although the amount need not be as much as is used in pavement construction. The air makes the concrete flow better into place around the steel and also prevents honeycomb and capillarity which would permit deep penetration of sewage acids into the body of the concrete. The surfuric and carbonic acid attacks are more confined to the surface.

• **Carbon affects air entrainment**—One of the problems we encounter when we use fly-ash from certain producing plants is the fact that the carbon in the fly-ash varies from time to time. A variation of even a fraction of a percent in the carbon will, using the same amount of air entraining agent, cause the air entrainment to vary from 2% to 10% or 12% counter to the way the carbon varies. This variation in the amount of the carbon takes place between shipments and sometimes even between sacks of fly-ash, hence the amount of the air entrainment is very difficult to control.

Where the fly-ash comes from a more efficient producing plant, the carbon runs quite uniform and the amount of the air entrainment can be fairly well stabilized, but where one boiler is operating inefficiently the carbon in the fly-ash will vary more or less depending upon whether or not that boiler was operating when the fly-ash was collected.

What is badly needed is a simple test which the inspector in the field can make to determine how much air entraining agent he should add.

One thing should be added with regard to the presence of carbon in the concrete mix due to the carbon in the fly-ash. Except for its diluting effect upon the amount of the fly-ash used and its absorbing effect where air entrainment is being used, the writer does not think that the carbon is particularly harmful. It might coat the aluminum silicate particles and thereby further slow up the rate of the fly-ash hydration, but the writer can see no chemical harm done by the carbon. The effects are all physical.

• **More protection in cold weather**—Other than this difficulty with the control of the air entrainment, we have had very little trouble with the fly-ash blend. Of course, we must always take into account the fact that the rate of the hydration of the fly-ash blend is slower in cold weather than it is where straight portland cement is used. Protection from the cold must, therefore, be better and longer continued for the blend than for the straight portland-cement mixes.

A thing we discovered in our experimental road construction, which may be of interest to others, was the fact that when we made the fly-ash content to exceed 25% or 30% of the total cementitious material, the concrete tended to become very "gummy" and sticky so that it was difficult to get it out of the mixer. In our laboratory we found that the most effective blend was one-third fly-ash to two-thirds by volume portland cement. This mixture produced the greatest strength after sufficient good curing.

• **Chemistry is complicated**—In his comment on the use of fly-ash in Baltimore, Mr. Chilcote expresses the opinion that "the fly-ash unites with the lime to form a material similar to natural cement." The accuracy of this statement is to be questioned.

In the first place, the chemistry of pozzolans is very complicated. Not much seems to be known about it. It is even doubted by engineers of the Sanitary District that the lime actually enters into a chemical union at all with the aluminum silicate of the fly-ash to form the cement, although lime is certainly needed to hydrate the pozzolan. How it acts we do not know.

In district experiments several years ago, 2x4 in. mortar cylinders were made of three cement mixtures as follows:

H1	Straight Type I portland cement
H13	Treated fly-ash 30% by weight and portland cement 70%
H30	Untreated fly-ash 30% by weight and portland cement 70%

These cylinders were placed in separate closed glass jars containing distilled water through which CO_2 gas was continuously bubbled and the amount of the calcium extracted then determined from time to time. The following table shows the results of these tests after 469 days of test.

Cement Mixture	Weight in Grams					
	Dry Cylinder	Portland Cement	Computed Lime Content	Fly-Ash	Ottawa Sand	Lime Extracted
H1	450	112	71	—	338	11¼
H13	471	82	52	36	332	10⅜
H30	440	77	48	33	330	9¼

Unfortunately, in these tests no attempt was made to maintain a uniform density. Nevertheless, the amount of the lime content in the mixture seemed to make very little difference in the amount of the lime extracted. If the lime in the pozzolanic mixtures had chemically combined with the aluminum silicate, why was it not more difficult to extract it in these tests?

Experiments in another laboratory indicated that when a pozzolanic material was placed in lime water the lime disappears from solution. However, if the calcium is necessary to the hydration of the silicate, may it not be that the lime came so intimately into contact with the silicate particle at the time it performed the hydration that it was precipitated in place upon the silicate particle and therefore disappeared from the solution?

A second reason for doubting that a chemical union of the lime with the pozzolan actually takes place is based upon an unverified report. The writer has been told that the mortar in the Cloaca Maxima in Rome, which was made by mixing volcanic ash with lime, now contains no lime at all. The lime has been all leached out, yet the mortar binds. If the lime is necessary to the cementing property, why does the mortar still bind when the lime has disappeared? Certainly it was necessary to the hydration in the first place, but evidently it acted only as a sort of catalyst to hydrate the silicate which constituted the real cement material (although lime is not usually considered to be a catalyst).

Possibly when the cement compounds first form the lime does enter into a weak chemical union with the silicate, but apparently the lime is not essential to the final compound.

Possibly others have made a crys-

talographical study of the products of the hydration to know what are the chemicals formed and whether or not the lime has actually entered into the chemical compounds.

Then again, pozzolans have qualities that are quite different from those of natural cement. In the first place, without the addition of lime to the mixture either as CaO or as a by-product of the hydration of portland cement, the pozzolan will not hydrate. Natural cement hydrates without lime.

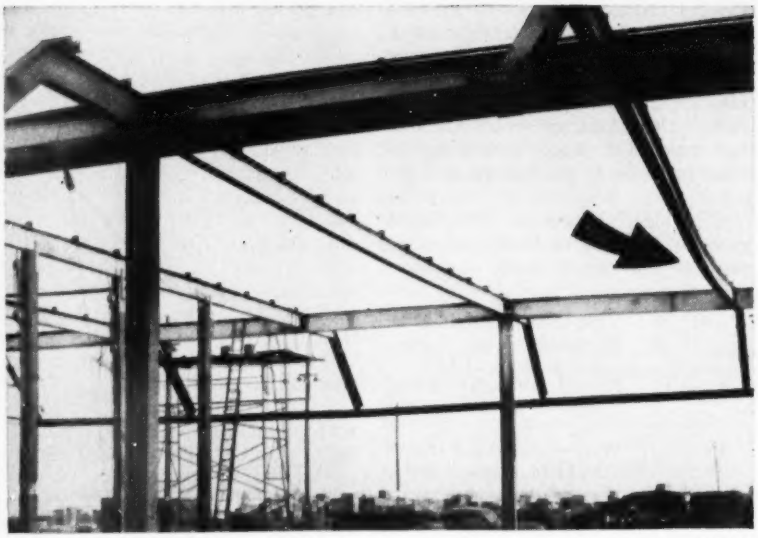
Pozzolanic blends, when hydrated, have qualities that are different from natural cement in their inter-reactions. For instance, pozzolans added to the mix have been found to markedly decrease the volume change that takes place when certain aggregates are used with a portland cement that contains an alkali. So far as the writer knows, natural cement if blended with the portland cement will not correct this expansion trouble when these aggregates are used, if the alkali is present.

A pozzolanic blend of fly-ash with portland cement also greatly increases the resistance of the portland cement to a sodium sulfate attack. A natural cement added to the portland cement in a blend also increases the resistance to the sodium sulfate but apparently for a different reason. Containing no tri-calcium aluminate in its own composition, it acts as a diluent of that present in the portland cement to reduce the net percent present in the blend so that the blend becomes less sensitive to the sulfate attack.

On the other hand, the pozzolana seems to cause the blend to resist the sulfate attack in a somewhat different way because the resistance is out of proportion to the amount of the pozzulana in the blend. It does not seem to lend resistance entirely by diluting the tri-calcium aluminate present in the portland cement, but lends resistance by some other mechanism of unknown character. We cannot, therefore, say that the fly-ash product of the reaction is similar to that of natural cement any more than we can say it is similar to that of the portland cement reaction. These reactions are all different but they all result in cement. In that way they are alike.

Reclamation rejects canal

Bureau of Reclamation engineers in the Sacramento, Calif., region have decided that the proposed $7.5-million Clikapudi unit of the Central Valley project in California is not financially feasible. The proposal called for a 13-mile canal to carry water from the Sacramento River to about 10,000 acres in southeastern Shasta County.



BEAMS BENT BY FIRE (as at right) were returned to original alignment (as at left). Supported by timber posts, they were subjected to oxy-acetylene flame at several carefully selected points. (Bob Wilson photo)

Bent beams: Flames did the damage and flames correct the deflection

A FIRE-DAMAGED, welded-steel warehouse frame was restored to original alignment in Alameda, Calif., recently by flame-straightening methods. Deflections of as much as 10-in. in beams spanning 60 ft were caused by a fire in the baled cotton contents of the building. But the frame was straightened ready for a new roof in only ten working days.

Flame straightening has been used to repair bent bridge members (ENR May 4, 1950, p. 32). And flame bending is common practice in structural fabricating shops. But use of such methods to repair fire-damaged members is rare. The Alameda work is the only case of its kind to the knowledge of the owner, contractor and insurer.

The building, owned by Encinal Terminals, an affiliate of California Packing Corp., is 90x120 ft in plan. Longitudinal girders (21 WF 62) of 60-ft span are supported on three columns. The girders support 60-ft span transverse beams, spaced on 20-ft centers, and extended 15 ft on either end with cantilevers. The fire did its worst damage to these transverse beams.

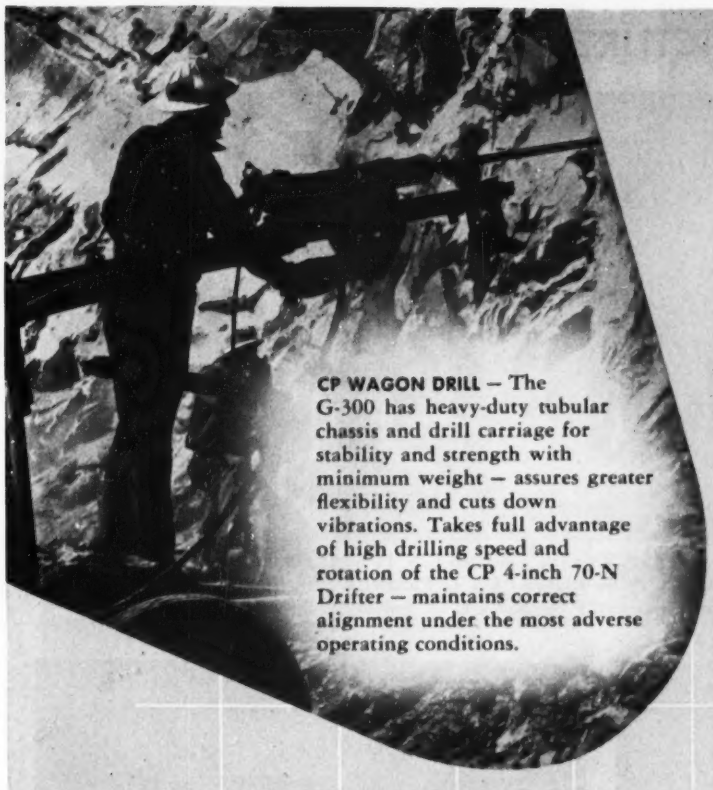
Maximum deflection of the longitudinal girders after the fire was 4¼ in. at a point where dead-load deflection before damage was 1 in. The five transverse girders were deflected an average of 6 in. (maximum 10⅜ in.). The pre-fire dead-load deflections were 2 in.

• **Flame straightening**—Straightening the members was accomplished by heating V-shaped wedges in the webs and flanges. The members were then rapidly cooled by quenching with wet burlap. On cooling, the heated portion contracts more than it has expanded, causing the member to bow up or, in this case, return to original position. About four such V-shaped spots were heated on the 60-ft spans. The work required skillful selection of the spots to be heated to result in a perfectly straight beam. Timber posts were used as a safeguard to support the members during straightening.

The contraction after heating caused some alterations in the molecular structure of the steel, but no significant change in its elastic properties.

• **Justifies heavy frame**—That the fire-damaged frame could be repaired at all is due to the heavy beam and girder construction, according to the owners. Under direction of H. A. Calkins, chief engineer, and M. C. Conkey, chief structural engineer, California Packing Corp. has constructed many such heavy all-welded structures in recent years. Mr. Conkey believes that had the roof of the Alameda transit shed been supported by more conventional light steel trusses, the building frame would have been almost a loss.

The Alameda building frame was repaired by Judson Pacific-Murphy Corp., Emeryville, Calif., at a cost of $2,344, or less than half the amount of a bid to replace the most seriously damaged members with new steel. Jack Williams directed the work.



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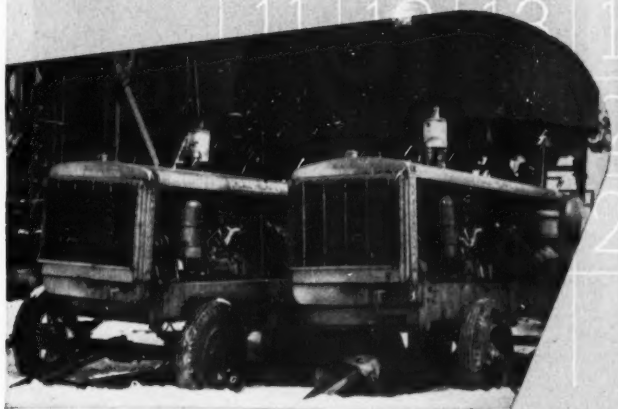
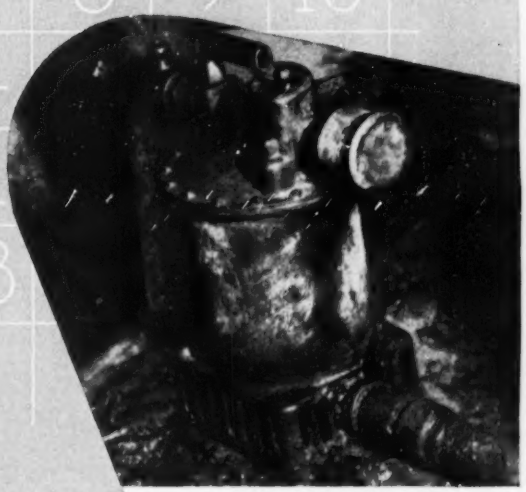


CP DIESEL AND GASOLINE DRIVEN PORTABLE AIR COMPRESSORS — available in ranges from 60 cfm to 600 cfm, CP Portable Air Compressors incorporate the CP Gradual Speed Regulator which reduces engine speed proportionately when air demand falls off.



CP PORTABLE SLUDGE PUMP — widely used on dam jobs and similar construction projects — handles up to 15% solids. No costly parts exposed to abrasion — operates on ejector principle.

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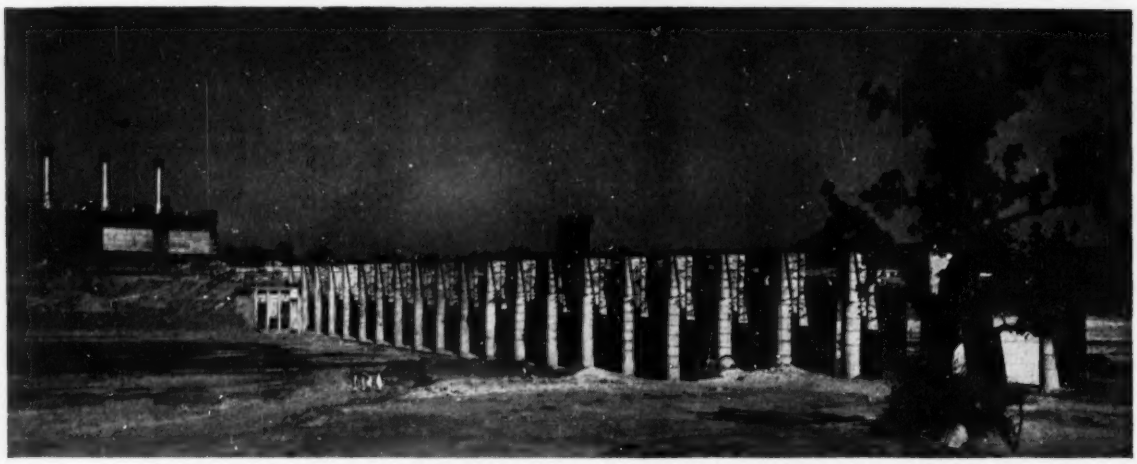
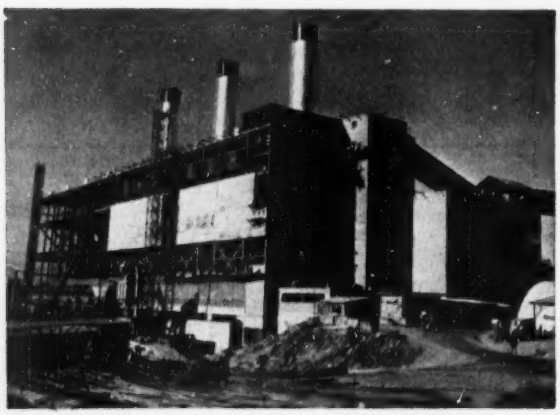
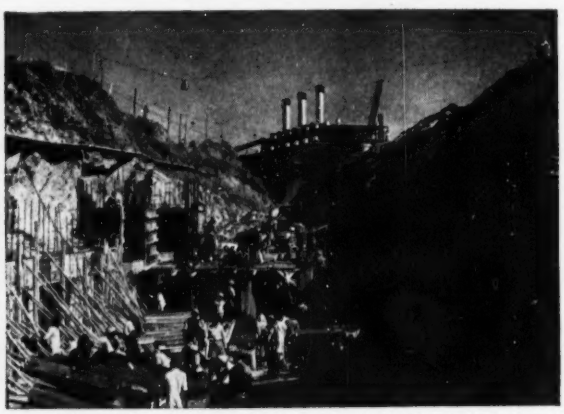


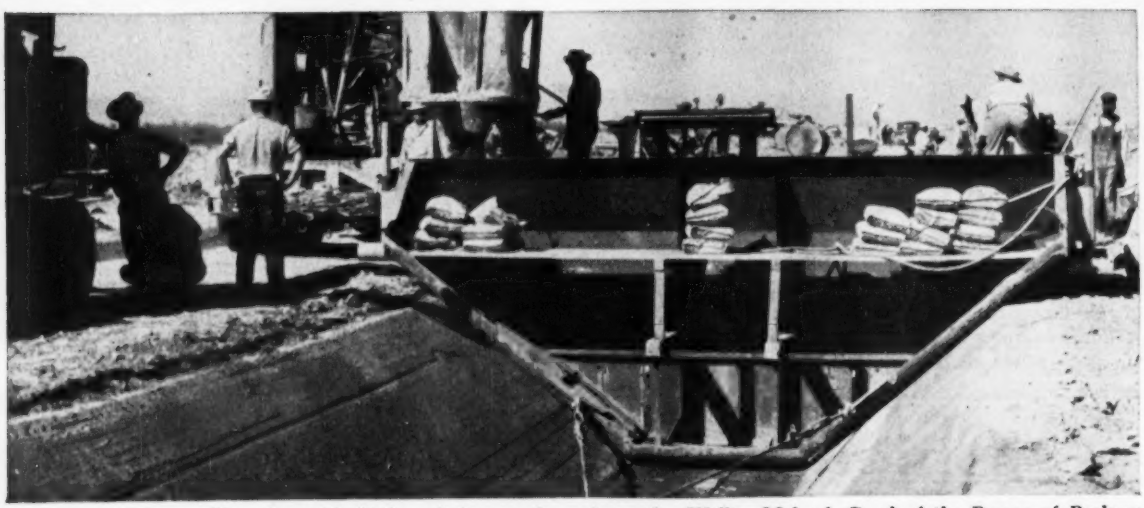
IN INDIA First power from Damodar Valley, India's TVA, was generated Feb. 19 when Prime Minister Nehru closed the switch on the Bokaro steam plant designed by the Kuljian Corp. of Philadelphia (see ENR Feb. 19, 1953, p. 199 for details). This diversion dam ponds and settles the Konar River flow for . . .



. . . the 200,000-kw steam plant, largest in the country, which will be fed 250,000 gpm of condensing water from this . . .

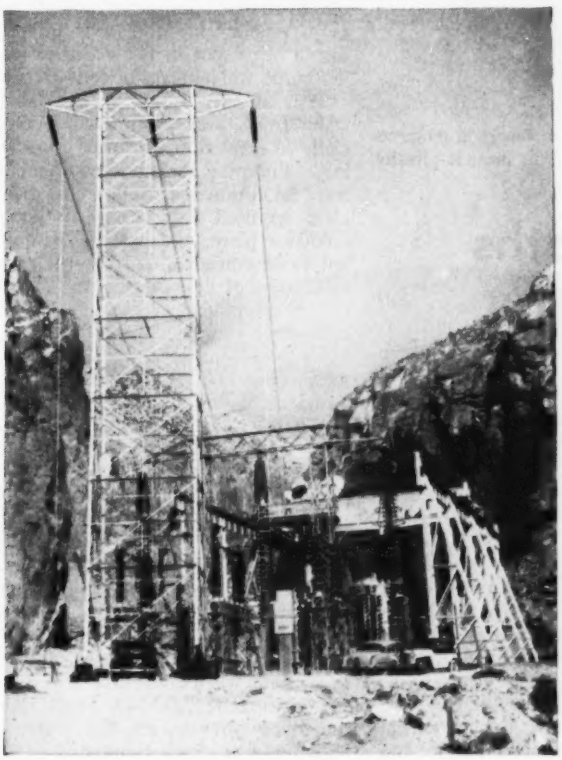


. . . large intake channel, which was made 1,200 ft long to aid in settling out the river silt during the flood season.

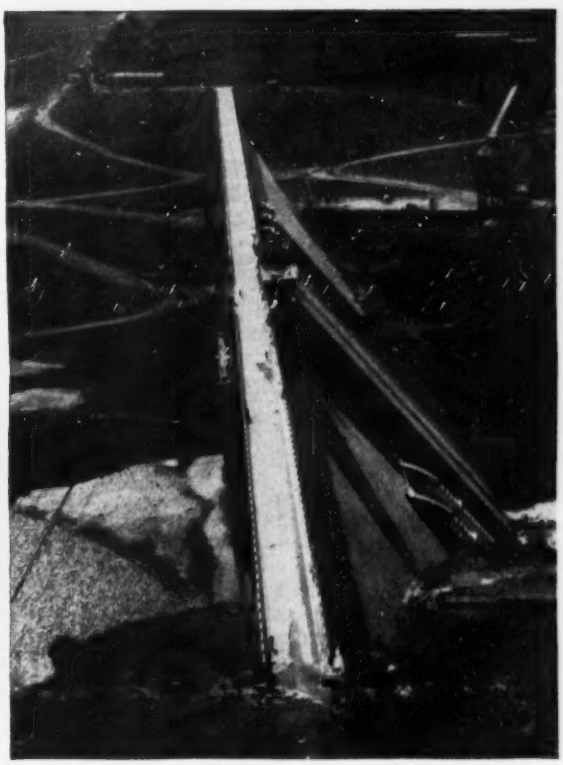


IN ARIZONA Use of special slip-form lining speeds work on the Wellton-Mohawk Canal of the Bureau of Reclamation's Gila project. Water already made available serves 10,000 acres, and eventually will irrigate 75,000.

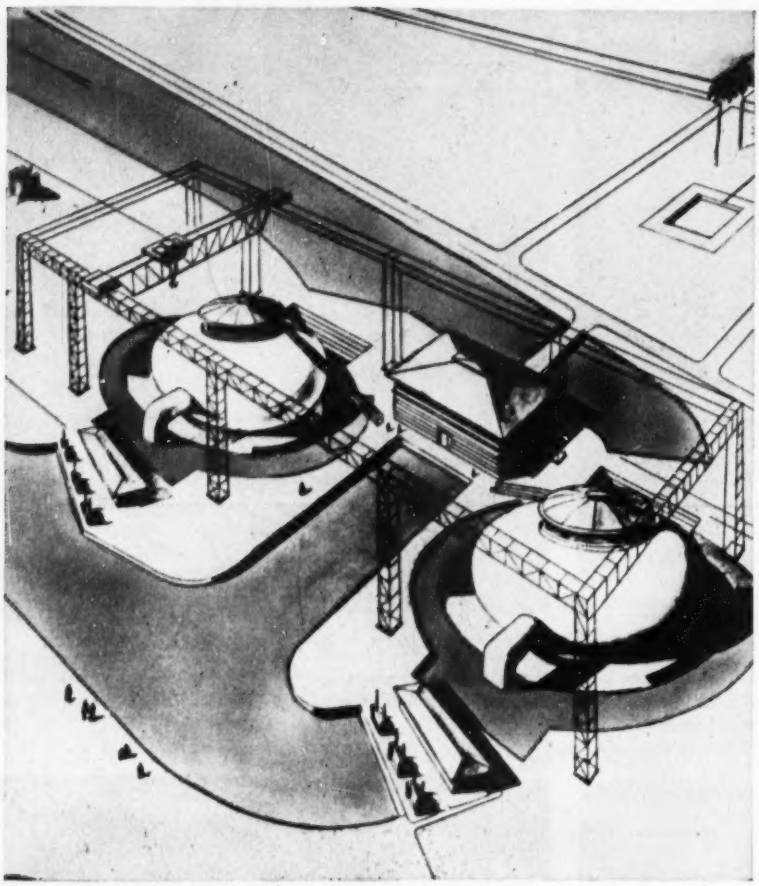
IN CALIFORNIA Heavy equipment of the Guy F. Atkinson Co. chews away at the tough half-million-yd excavation job for the 7,000-ft tailrace (left) of Folsom Dam power plant. At right, the 15½-ft penstock tunnel is begun with the aid of heavy timbering. Located on the American River east of Sacramento, the dam is a Corps of Engineers' job, while the power facilities are a Bureau of Reclamation responsibilty.



FOR LOS ANGELES More power is on the way from switchyards such as this at the powerhouses of the Owens Gorge Project. The Los Angeles Department of Water and Power has two of the powerhouses operating, and the third will be finished this spring. In all they add 112,500 kw to the department's capacity.



IN OREGON Finishing touches are being put on 463-ft Detroit Dam, highest yet built by the Corps of Engineers. Power generation is expected by June. The dam, on the Santiam River, 65 miles south of Portland, is a part of the Willamette Valley multi-purpose project, and is being built by Consolidated Builders, Inc., one of the Kaiser organizations.



POWER PLANT OF TOMORROW may produce electricity from energy in temperature differentials of the sea. Fresh water would be a by-product. This plant is actually designed for Africa's Atlantic coast.

French explore sea depths for power and fresh water

A TRIAL LENGTH of undersea pipeline soon to be installed off the coast of Africa will push one step nearer to consummation a pet scientific dream—extraction of fresh water and power from the sea.

Scientists for years have looked upon the sea as a great reservoir of power. Temperature of the sea varies with depth, and any temperature gradient is a source of energy. Fresh water, as a by-product of this thermal-differential power, makes the concept even more attractive.

Latest to tackle the problem is a partly government-owned French corporation called Energie des Mers. It is pushing hard for commercial application of the proved possibilities of sea power, and A. Nizery, general director of the company reports that design of the first "sea-power" station has been completed. Full-size equipment has been built and operated. "Industrial" quantities of vapor have been produced and condensed at low pressure with equipment Energie des Mers believes eventually will be used commercially.

And now the organization is about to build a 150-meter length of conduit 400 meters under the sea at Abidjan in the Ivory Coast district of French West Africa. This practical test will influence final decision on whether to build the first 3,500-kw unit of a two-unit station designed for the site. Cost of the plant has been estimated at more than $2.5 million, plus the unestimated price of a deep sea-water intake. Financial backing is sought.

French interest in this potential source of energy began with Georges Claude who experimented from 1926 to 1934, in France and off Cuba, without definite results. (At least, financial backers were not encouraged.) In 1942, the Ministry of Colonies and Centre National de la Recherche Scientifique formed a research group. And, in 1948, Energie des Mers grew out of this group with the definite assignment of developing a power station for Abidjan.

Power was the prime goal—power so vital to countries of meager hydraulic resources and fuel supplies. Fresh water from salt water was an important by-product. The planned 7,000-kw station would produce an estimated 3.4 mgd of distilled water.

What Energie des Mers has developed is an engine to operate on a 40 deg F temperature differential. Its boiler would be heated by water from the surface at about 82 deg F; its condenser would be cooled by water from the depths at 42 deg F. The engine—boiler, turbine and condenser—would be in a vacuum so that the differentials in vapor pressure could be utilized.

• **Problems**—Before a plant could be developed 1) chances of drawing water of fairly constant temperature out of the ocean had to be established; (2) vaporization of water at 82 deg F had to be explored, equipment designed; (3) a turbo-generator unit, having a single, extra-large wheel and a sealed casing to hold the high vacuum, required research and development; and (4) a pipeline hundreds of yards out into a deep spot in the ocean needed designing and a means of construction.

It is no easy job to bring up cold water from the ocean's bottom—especially in great flows required for cooling. Pumping energy requirements must be minimized. Supply-line diameters required are great—8 ft for a 7,000-kw plant—and lengths are quite apt to be considerable from the coast to a point of desirable depth. (Floating plant might overcome this last difficulty.)

• **Solutions**—The first of the above problems was assigned to hydraulic researchers in the Neyrpic Laboratory at Grenoble, France, who studied the water requirements of a 50,000-kw plant. Their findings: An intake drawing a flow of 2,825 cfs (which would be necessary to supply a 50,000-kw plant) would suck water from a 260-ft thick layer—130 ft above and 130 ft below the intake. All the water would be at about the temperature existing at the intake before the suction is applied. This result will be achieved still more exactly for the 7,000-kw plant since the layer from which the water is pulled will be much thinner.

A second problem was extraction of gases dissolved in the water. Study was divided in two: At the National Hydraulic Laboratory at Chatou a "degaser" was investigated. The second study by a manufacturer's design

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● Just 40 of these National Seamless Steel Bottles will hold a million cubic feet of gas—safely underground, away from aircraft, storms and weathering.

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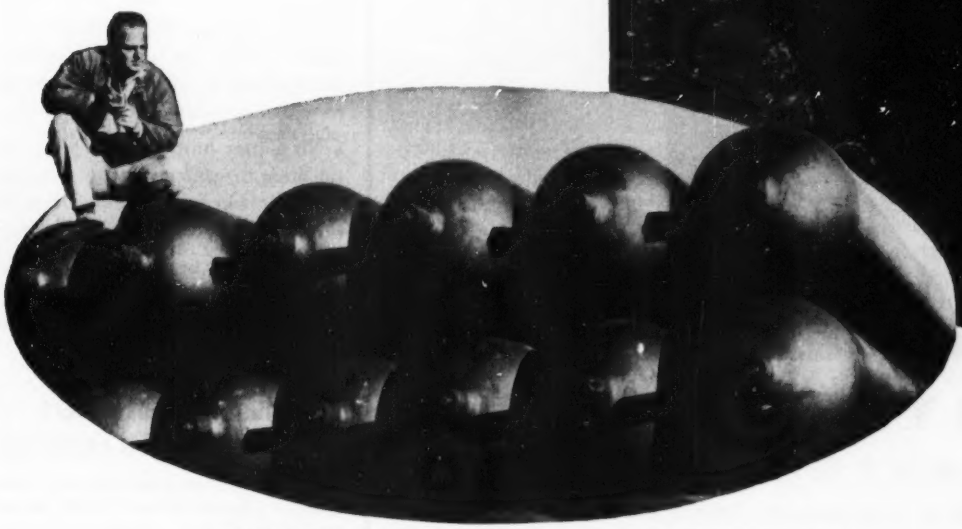

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Fair Weather or Foul... No Water Can Enter Head to Freeze, No Sediment Can Reach Operating Thread

• The stuffing box plate, cast integral with the nozzle section, covers the entire area of the head and, with the packing, prevents water from reaching the operating thread. This means no rust can form and no sediment can be deposited on the thread to wear and destroy it.

• No matter how cold the weather, the stem thread cannot freeze to the nut, nor can ice form inside it to interfere with closing the hydrant.

• Community fire protection is assured with the installation of Mathews Hydrants—vital links between hose and water main.

No Other Hydrant Offers So Many Essential Features:

Compression type valve prevents flooding • Head turns 360° • Replaceable head • Nozzle sections easily changed • Nozzle sections easily raised or lowered without excavating • Protection case of "Sand-Spun" cast iron for strength, toughness, elasticity • Operating thread only part to be lubricated • All working parts contained in removable barrel • A modern barrel makes an old Mathews good as new • Available with mechanical-joint pipe connections

bureau, investigated the "machine" which is to extract dissolved gases. This machine is an adaptation, with a better yield, of the rotary air extractor designed for Georges Claude in 1929.

A turbo-generator unit had to be built within a vacuum casing. Its shape was chosen to be that of an elipsoid (its axis of revolution, minor axis of the elipse) joined to a sphere on its lower part. Casing is of reinforced concrete; leakage would be prevented by a metallic coating or a complex plastic coating which has been tested by Energie des Mers. The rotor of the turbine is of 26-ft diameter and capable of 600 rpm.

Last major problem, the cold water supply line, was simplified somewhat by an undersea crevasse off Abidjan, 1,300 ft deep only 2.5 miles off-shore. Flanged steel pipe bolted together and buried in the sea bottom will carry out past the bar zone and from contour zero to −14 (meters). A second type of construction, semi-rigid welded steel lengths 165 ft long connected by flexible rubber joints, will extend over three-quarters of the intake's length and from contour −14 to −110. A similar, but more flexible, third section will drop steeply to the intake at contour −420. Major construction problem will be rough waters. But a special float from which pipe will be laid has been invented, with deep, vertical buoyancy drums giving it stability in the sea. This float was tested off Brest in 1947 with satisfactory results.

• **Distilled water**—Vapor that has gone through the turbine can be made to condense on tubes carrying cold water. (A tubular condenser has been found to be as effective as a direct contact condenser.)

If this energy-from-the-sea power station is to be built, its costs would be assigned to production of power. Therefore, the price of producing fresh water from this plant would be simply the cost of adding tubular condensers, according to Mr. Nizery. Figured this way, cost of water is estimated at 8 francs per ton—or just under 9 cents per 1,000 gal.

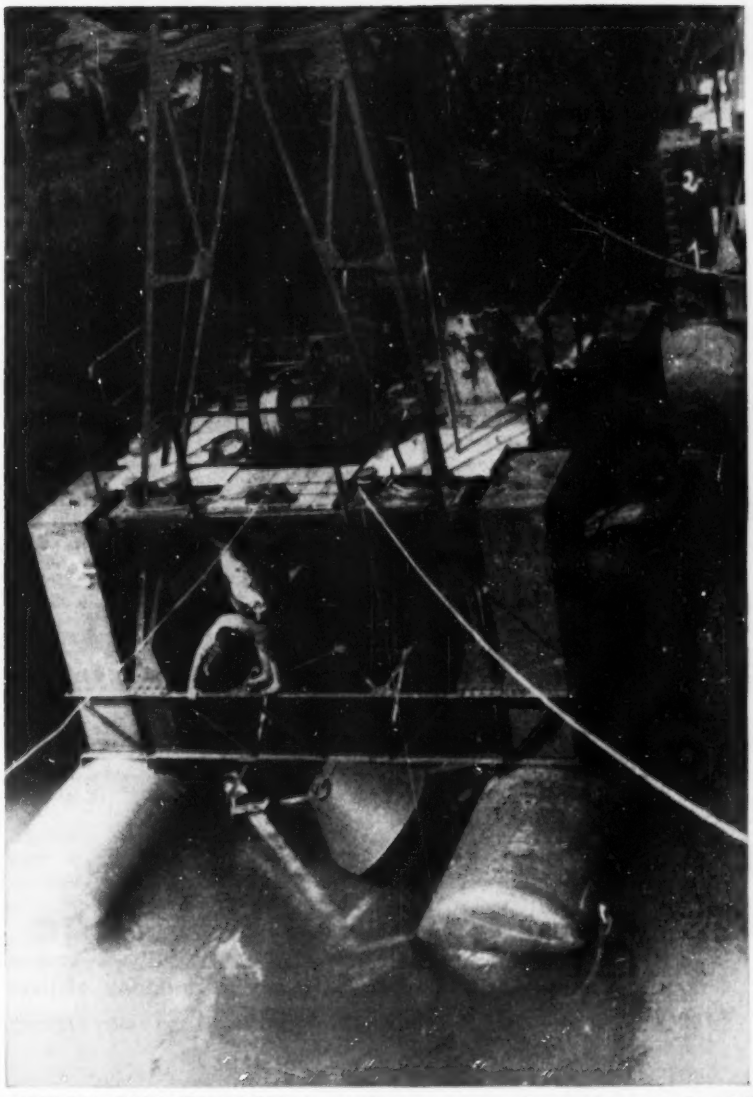
Energie des Mers has based most of its power plant investigation on a 20 deg C differential in temperature. It doubts that power production could pay for itself at any lesser differential, although production of fresh water would remain feasible. Experiments have been carried out to investigate possibilities of an artificially increased temperature differential by solar radiation of surface waters in shallow basins.

• **California sequel**—Research into the French process, as well as other means of desalting sea water, has been under way for some time at the University of California at Berkeley (ENR May 15, 1952, p. 28). Dean E. W. Howe and Byrn Beorse have been two of the principals involved. Their experience with and calculations on the thermal differential process are in accord with the above-reported information from Mr. Nizery.

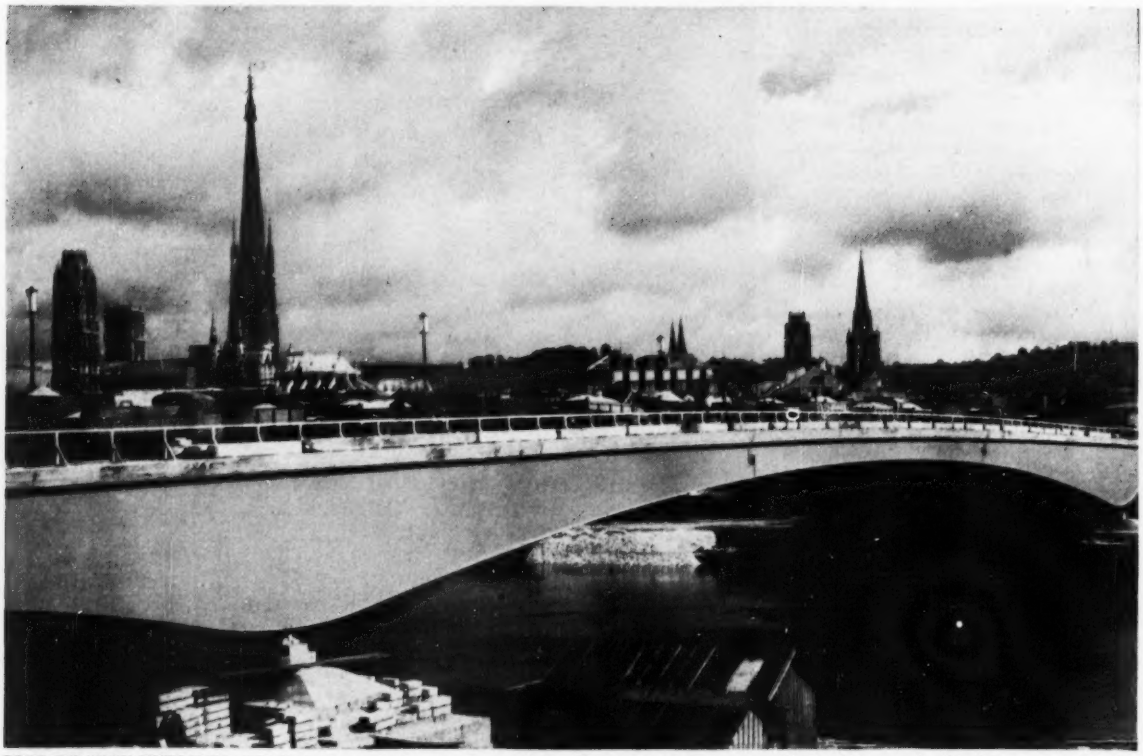
Dean Howe points out, however, that calculations by Mr. Beorse find less net power output, a much higher demand of power for pumping, than is indicated by the French work. Specifically, Mr. Beorse states "that a plant to produce water at 100,000 gpd on a 35 deg F differential temperature is about the lower limit for positive power production.

A pilot plant now under design would furnish 220 hp to run pumps, and produce 100,000 gpd of distilled water. Cost of water produced is estimated at 20 cents per 1,000 gal, a fairly reasonable figure if it can be assumed to be pure as discharged from the distillation process.

California research has been aimed at use of ocean and river waters. But the possibilities of using spent industrial coolants as the warm water has been pointed up. According to Dean Howe, a member of the government of Curacao, Netherlands West Indies, has been interested in using warmed cooling water from petroleum refineries in a temperature differential power-water plant. This would obviate cost of the deep sea pipeline. The plant is currently under consideration.



DEEP-SEA CONSTRUCTION of a pipeline to extract cool water is soon to be tried from hoist floats like this. Success of the pipelaying trials will decide fate of the proposed temperature-differential power-water plant project.



ONE OF THE WELDED SPANS of new bridge at Rouen being load-tested by trucks filled with gravel. Deck-type construction permits unobstructed view of cathedral (left) and spire of city hall (right). (Photo by Moignard)

French choose welding for heavy-traffic Seine bridge

Pont Corneille at Rouen, with two 328-ft spans utilizes shop-welded box girders braced by field-welded sway frames

Completion of a new bridge over the Seine River at Rouen, France, marks a great step forward in the reconstruction of that war-wrecked city, yet the importance of the bridge traffic-wise is at least equaled by its technical significance. For it is an all-welded structure—the first of any size since the war, and only the third notable one undertaken since failures of welded bridges in Belgium and Germany in the 30's gave structural welding in Europe a setback. The other two (ENR Nov. 1, 1945, p. 80) started before the war are at Paris—the Pont Neuilly, containing a 269-ft and a 219-ft arch and the Pont St. Cloud containing six 100-ft girder spans.

The new Pont Corneille, as it is called, replaces two three-span stone arches across arms of the river separated by an island, which had been in service for 112 years before the French destroyed them in 1940 to slow the advance of the German army. Both a major link in the main highway joining the west and north of France, as well as the principal river crossing in a city of 300,000 people, the old bridge with its 30-ft roadway had long been a serious bottleneck to road traffic. The two piers in each arm of the river also were hazardous as obstructions to river traffic.

• **Arrangements and dimensions**—The new bridge crosses each river arm with a 328-ft clear span and has a 60-ft roadway. Two 15.5-ft sidewalks give its deck a total width of 91 ft. Of deck cantilever type, each of the two spans has anchor arms of 90 ft on the shore end and of 51 ft on the island end. Counting a short connecting section on the island, the total length of the structure is about 975 ft.

The main members of the bridge are nine box-type girders spaced as shown in the accompanying drawing. Each girder is 32 in. wide and varies in depth from 4.3 ft at the center of the span to 17 ft over the piers. Longitudinal and vertical stiffeners are used on both sides of the webs of all except the outside girders, which are left smooth on the exterior for the sake of appearance. Interior diaphragms in each girder and x-braced sway frames between the girders are used at a longitudinal spacing of about 20 ft to give transverse stability to the framework.

Installation of the sway frames between girders constituted the only field welding required on the structure. Each main span contains a 112-ft shop-fabricated suspended section whose ends are equipped with shoes that rest on shelves on the ends of the cantilever arms.

The cantilever arms and the anchor arms were shop-fabricated as single units, which the French call consoles. Those at the shore ends are 198 ft long and weigh 120 tons. The island-end consoles are 159 ft long and weigh 100 tons. The ends of the shore consoles are anchored to the abutments—more exactly counterweights—through eyebar links. Rocker shoes are used at the piers, and fixed shoes are used at the island ends of the Pont Corneille.

• **Chosen for economy and appearance**—The welded steel cantilever type of construction was chosen after careful consideration of several other possible

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Mountings for 900-ton TWIN VIADUCTS on the C&O Ry.

PROTECT BOTH CONCRETE and STRUCTURE

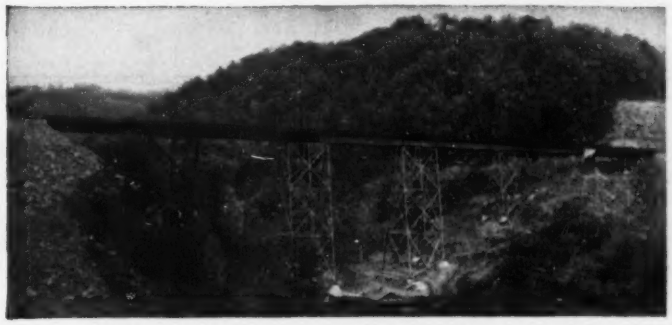
The Viaduct over West Fork is 176′ high and 850′ long. Viaduct over Arnold Fork is about the same height and 701′ long. Towers, consisting of four supports 50′ apart, are spaced at 100′ intervals beneath the span.

Fabreeka Pads, 41″ x 41″ x ½″, are installed beneath the 4 inch steel pedestal bases to separate and equalize the bearing surfaces of concrete and steel, and to seal out weather. The abutments are equipped in the same way, but with smaller FABREEKA Pads measuring 19″ x 39″ x ½″.

FABREEKA Pads Insure Even Distribution of Load

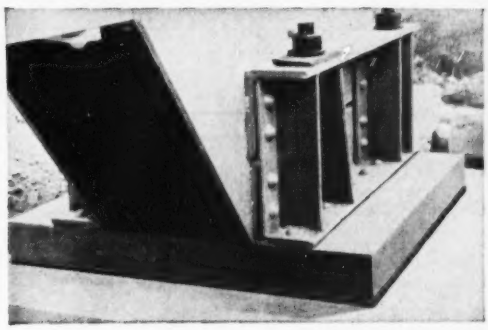
FABREEKA Pads beneath the steel columns adjust themselves to the bearing surfaces of the concrete foundations, insure even distribution of the load, and eliminate grouting.

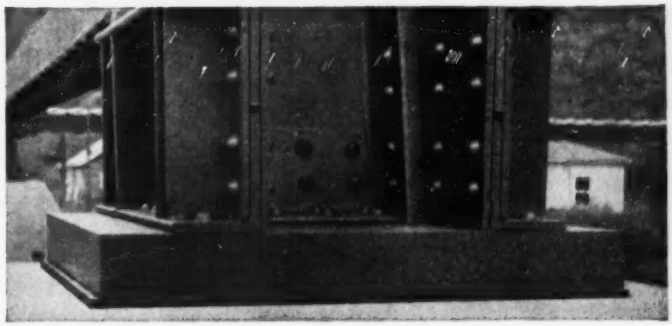
FABREEKA Bridge Pads absorb impact shock and vibration and prevent flaking and cracking of the concrete foundations.



FABREEKA Mountings are used on this 850′ viaduct on the Chesapeake & Ohio Railway over the West Fork in Kite, Ky.

FABREEKA Mountings are also used on this 701′ Arnold Fork viaduct on the Chesapeake & Ohio Railway, likewise in Kite, Ky.





Fabreeka Bridge Pads are an essential part of modern bridge construction because of their proved accomplishments and long life.

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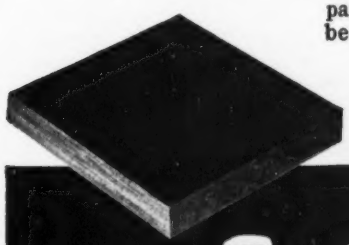

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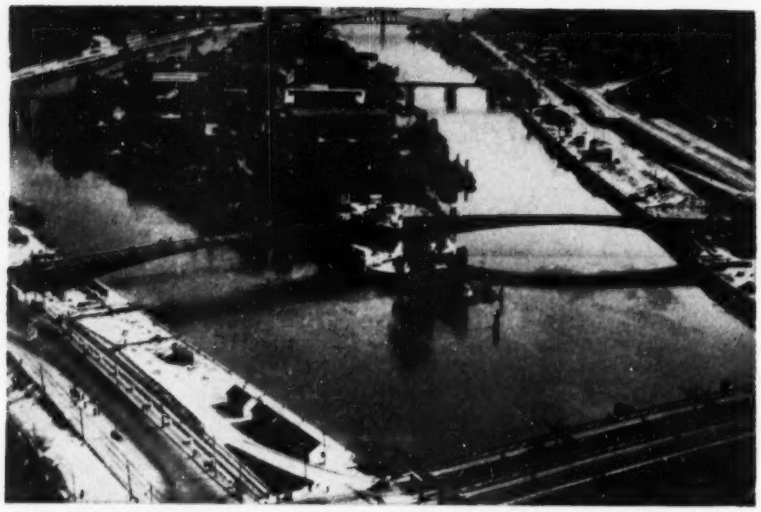


TWO ARMS OF SEINE are spanned by the new Pont Corneille which (at right) joins a new elevated boulevard built on the top of a prestressed concrete structure that encloses a 1¼-mile rail line along the river bank. Temporary bridges span the river both upstream and downstream, and in background is the rail bridge that was twice wrecked and twice rebuilt during the war. (Photo by Photoclau)

solutions of the problem were made.

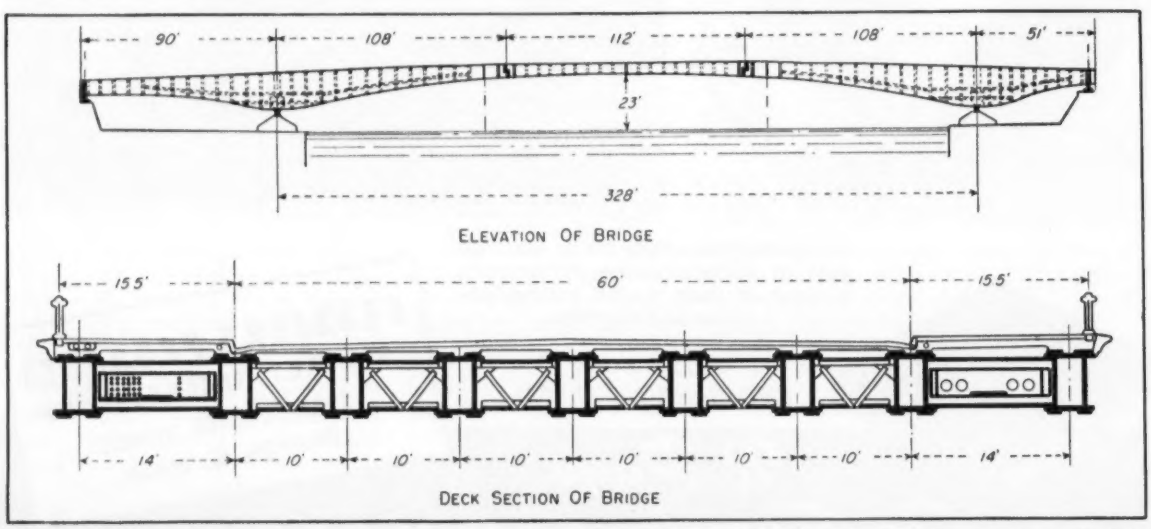
J. Velitchkowitch, engineer of bridges and roads of the Port of Rouen, who was in charge of design and construction, discussed this question in an address to the Institut Technique du Batiment et des Travaux Publics. He said that, because of the prominent location and the proximity to the cathedral, a deck-type structure that would not mar the view was desired. Study of a concrete cantilever showed it to be too costly and too difficult to erect. Steel arches, in order to obtain proper river traffic clearance, gave too steep a grade on the roadway and rose too high in the air for satisfactory appearance. A study of a prestressed concrete design showed that its cost would be too great to be given consideration.

As between riveting and welding, M. Velitchkowitch said economy seemed to favor welding. About 20% less steel was required, and the final cost worked out at about 12¢ per lb. A riveted bridge built at another location at about the same time cost 13¢ per lb.

As to choice of welding on technical considerations, he said that careful studies were made of the reports of early failures of Belgian and German bridges and of the failures of U. S. Liberty ships during the war. Since all of these failures were explainable in terms of poor design, poor workmanship or unsuitable steel, they were not held to offer compelling reasons to avoid the use of welding. Moreover, the eight years of successful service of the welded Paris bridges at St. Cloud and Neuilly and the optimistic reports on them by their designer, L. Alexandre Levy, favored the use of welding.

The conclusion was that if care were exercised to avoid the conditions that contributed to the earlier failures—too thick plates, multi-axial stresses, locked up stresses from poor details or wrong welding sequence, unsuitable steel, abrupt changes in section and poor welding technique—there was no reason why welding would not be entirely safe and satisfactory. Since, in addition, the welded steel cantilever design seemed to be the least costly, would have a pleasing appearance in keeping with the surroundings, and could be erected by available floating cranes without recourse to falsework in the river, this type was selected.

• **Basic specifications**—As a prelude to design and fabrication it was stipulated that a weldable type of steel—open hearth, low carbon (0.% to 0.12%) and 60,000 psi ultimate strength—be used. All plates should be 1 in. or less in thickness. Weld beads connecting the flange plates to the web plates of the girders should be from ¼ to ½ in. and intermittent, with a ⅛-in. weld used between for corrosion resistance. Joints were to be arranged so as not to create restraints. The beads attaching the stiffeners were to be stopped short of intersecting any splice welds —in the webs. Also the splice welds of the flanges and those of the webs were never to be placed in the same transverse plane. Abrupt changes of section were to be avoided. Where plates of unequal thickness joined, the thicker was to be chamfered on a length of 2¾ in. before the joint was reached.



NINE BOX GIRDERS comprise main framework of Pont Corneille's welded spans. As shown in the bridge elevation, each girder was fabricated in three erection pieces, the heaviest weighing 120 tons.

As to welding sequence, transverse joints were always to be made before longitudinal ones. The latter were to be built up first on one face of the plate then on the other and in two manual passes followed by a machine weld. Down-welding, with the plate lying flat, should be used for manual work.

It was also required that welders be qualified by strict control tests. Also that all welds be x-rayed, to reveal poor welds if they occurred, but mostly for the psychological effect that such inspection would have on the welders.

• **Makeup of the girders**—One result of these specifications was the girder makeup shown in the accompanying drawing. This is the maximum section, which occurs in the console portion of the girders over the piers. Toward the ends of the consoles the web reduces to $\frac{5}{8}$ in., but otherwise the section does not change. At the supports the webs are doubled in thickness by the addition of a 6-ft square plate.

In the suspended portion of the girders, a lighter makeup is followed. The webs are $\frac{1}{2}$-in. plates, the two lower flange cover plates are $\frac{1}{2}$ in. each instead of 1 in. and $\frac{3}{4}$ in., and the top flange, while unchanged in thickness, utilizes a narrower top cover plate—6 in. instead of 16 in.

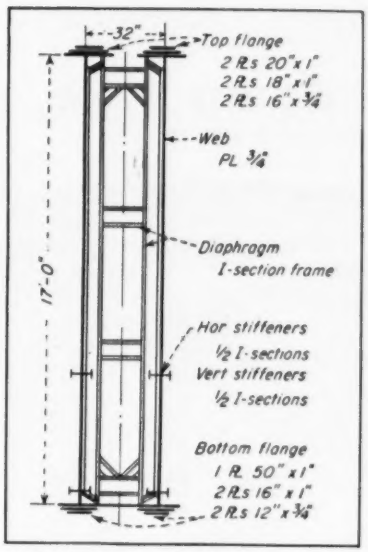
In the deeper plates two horizontal joints are required. Vertical joints are spaced variously according to the lengths of plates available, except that no vertical joint is allowed over the supports. Stiffeners are T's made of split I sections, and the diaphragms are frames made of full I sections.

It will be noted that while the bottom of the box section is closed by the lower flange, the top is left open by dividing the upper flange into two halves. This arrangement permits access for the welders and later for the painters. The diaphragms are also of open type for this same reason.

• **Welding of the girders**—Two different structural shops fabricated the girders—Schimd, Brunetон et Morin located near Paris handling the suspended portions, and Enterprises Metropolitaines et Coloniales of Rouen the consoles. Both followed the same procedures.

Taking the console as an example, the order of welding was as follows:

1. Lay out flat the plates to form one of the webs and make two manual passes on the transverse (vertical) joints and one pass on the longitudinal joints.
2. Tack weld the previously welded upper flange to the web.
3. Turn the assembly and make two manual and one machine (Union-Melt) pass on both the transverse and longitudinal joints. Also make the machine weld joining the flange to the web.
4. Turn the assembly again and make a machine pass over the initial two manual passes on this face. Also place a machine weld on this side between the web and the flange.
5. Turn the assembly a last time and weld on the stiffeners and the diaphragms.
6. Perform the same operations on the other web of the girder.
7. Weld the two web-top-flange assemblies to the previously welded lower flange.



STRUCTURAL MAKEUP of welded girders used in bridge at Rouen, France.

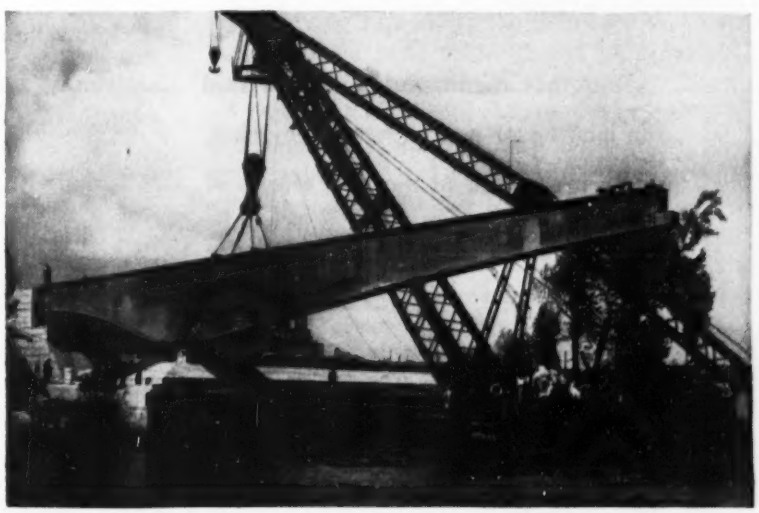
By following this order and technique, it is believed that all restraints were avoided. A few welds lacking penetration had to be cut out, and some warping occurred which was removed by heating, but in general the fabrication was completed without unexpected difficulties.

• **Erecting the girders**—Transport of the suspended portions of the girders from Paris was effected by ordinary rail equipment while the heavier consoles were moved from shop to site on special rail-mounted dollies.

A floating crane of 150-ton capacity picked the consoles from the railhead near the bridge and set them in place. They were suspended from the crane hook by a sling of four 2½-in. dia wire ropes, so placed that the abutment end of the girder would swing lower than its final position. This permitted the eyebar anchors to be attached easily. Once this was done the girder was lowered to its shoe on the pier.

Four consoles and four suspended girders were erected (the latter by a 50-ton floating crane) and braced temporarily before any of the sway-bracing frames were welded in. This work was carried out when there was no sun or at times when the sun struck both up and downstream faces of the girders equally, since otherwise there was too much distortion. The sway frames were erected piece by piece—first the lower horizontal member, then the upper and finally the diagonals. They were attached to the girders through both horizontal and vertical gussets, which permitted some tolerance in the dimensions between girders.

The bridge's deck is made of precast concrete slabs each 7.5 ft square, 7 in. thick and weighing 2. 5 tons.



GIRDER ERECTION was carried out by floating cranes. This one, of 150-ton capacity, lowers a console section onto pier after end has been connected to the eyebar that links it to counterweight foundation. (Photo by Moignard)

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PROSPERITY IN THE USA: How Deeply in Debt Are We?

How prosperous *are* the people of the United States? Previous messages in this special series have answered this question in part by recording the progress—relatively slow progress—we have made in increasing both the income and the wealth per person in the USA.

This fourth and concluding piece of the special series deals with the extent to which our prosperity should be discounted because it has been accompanied by an increasing volume of debt. Many correspondents have suggested to us that an individual or a nation can temporarily increase prosperity by borrowing, but in so doing lives on both borrowed goods and borrowed time. Our purpose here is solely to throw light on the question of whether or not we are now in that unenviable position.

On January 1, 1953, the total debt of the United States government and of its citizens was $627 billion, as shown in the table below. On its face, a debt of this magnitude, which represents about $3,900 of debt for each person, suggests that we are heavily debt-ridden.

TOTAL DEBT – PUBLIC AND PRIVATE

Federal government debt	$267 billion
State and local debt	30 "
Private debt	
Corporations	195 "
Individuals	135 "
	$627 billion

The burden of our debts, however, does not depend simply on their size. It depends in much more decisive degree on our capacity to carry the load successfully. This capacity, in turn, is partly a matter of attitude, and attitudes defy objective measurement. A community that gets very jittery about its debts has less capacity to carry its burden successfully than one that does not. But the accurate measurement of jitters, present or prospective, still remains to be mastered.

Capacity to Carry the Debt Load

Nonetheless, it is possible to throw some light on our capacity to carry the debt burden by studying key economic elements that can be measured with some degree of accuracy. The following paragraphs indicate how some of these key economic elements stand.

Compared with our national income, the total volume of our debts, public and private, is still well below the level of 1929, when it proved to be too big for the good of the country. Our total debt is now 113% greater than the national income whereas in 1929 it was 146% greater.

There are several other cheering facts about our debts. One is a sharp decline in interest rates which makes the cost of carrying our debts relatively much less than it was in 1929. It took 8% of our total national income to carry our debts in 1929; it takes only about 5% of the income today.

More Cheering Facts

We also have much more ready cash now than in 1929. Today individuals and corporations hold a total of $269 billion in cash or its equivalent which is almost twice as much as the portion of private short-term debt (about $140 billion) that is subject to sudden demand for payment.

Many students of the subject cite the relatively low cost of carrying our debts and the large volume of cash on hand, and reach the comfortable conclusion that our debt burden is nothing to worry about. In further support of this view they emphasize the fact that no important part of our debt is owed abroad. Hence, they reason there is not the danger, so conspicuous in Britain since the end of World War II, that our economy will be upset by the necessity of making heavy debt payments to other countries.

Some Dangers of Present Debt

However, the nature of our debts presents dangers that it would be foolish to ignore. This is true of both the debt of $267 billion owed by the federal government to its citizens and the $330 billion in private debts owed by some citizens and corporations to others.

Public debt can be a dangerous kind of debt because government has the power to print money or to create its equivalent by expanding bank credit. Of the $215 billion that the federal government borrowed during World War II, over $90 billion was borrowed from banks. This was the largest single contributor to the inflation of prices that since the war has robbed the dollar of about half of its purchasing power, and thereby robbed the buyers of government bonds of about half the purchasing power these bonds were supposed to represent.

If, as is quite possible, a new emergency should again require the federal government to borrow heavily while its debt remains so high, it is doubtful that the public would be avid to buy its bonds. Hence, the government might again be forced to resort to the inflationary process of relying on bank credit.

Private debts can be dangerous if the people take on new debts more rapidly than is justified by the growth of business or by their ability to repay. Last year bank loans were increased by the imposing sum of about $6½ billion, which represents an increase of about 11% in total loans outstanding. This is almost twice as much as the increase in the volume of business over the same period. Installment credit for consumers increased by $3 billion last year, again an increase in debt about twice as great as the increase in business volume in the fields where the credit was used. It is also the fastest rate of such growth in our history.

Constructive Use of Credit

So long as the expansion of credit does no more than keep pace with expansion in the volume of business, the expansion is constructive. Also, when credit is expanded to acquire resources and equipment that will enlarge the volume of business a little later, that use is clearly constructive. But when private credit expansion begins to run ahead of business growth, it is time for us to be heads up. Such credit expansion courts price inflation. It also creates a forced draft under business so that, if credit is cut off, there may be a painful drop.

To give a summary answer to the question: *Is the level of debt in the United States a danger to our prosperity?*—the answer seems to be, "Not at the moment." We owe nothing abroad. The interest burden on present debt is relatively small, and we appear to have the resources to handle the short-term debt. Yet both the total amount of debt and the recent rapid increase in total private debt, especially the latter, are enough to signal for caution. We need restraint on the part of business and consumers to avoid expanding private borrowing at an excessive rate. The federal debt needs to be reduced and put in more manageable form. If these things are done, we can proceed to build a sound prosperity.

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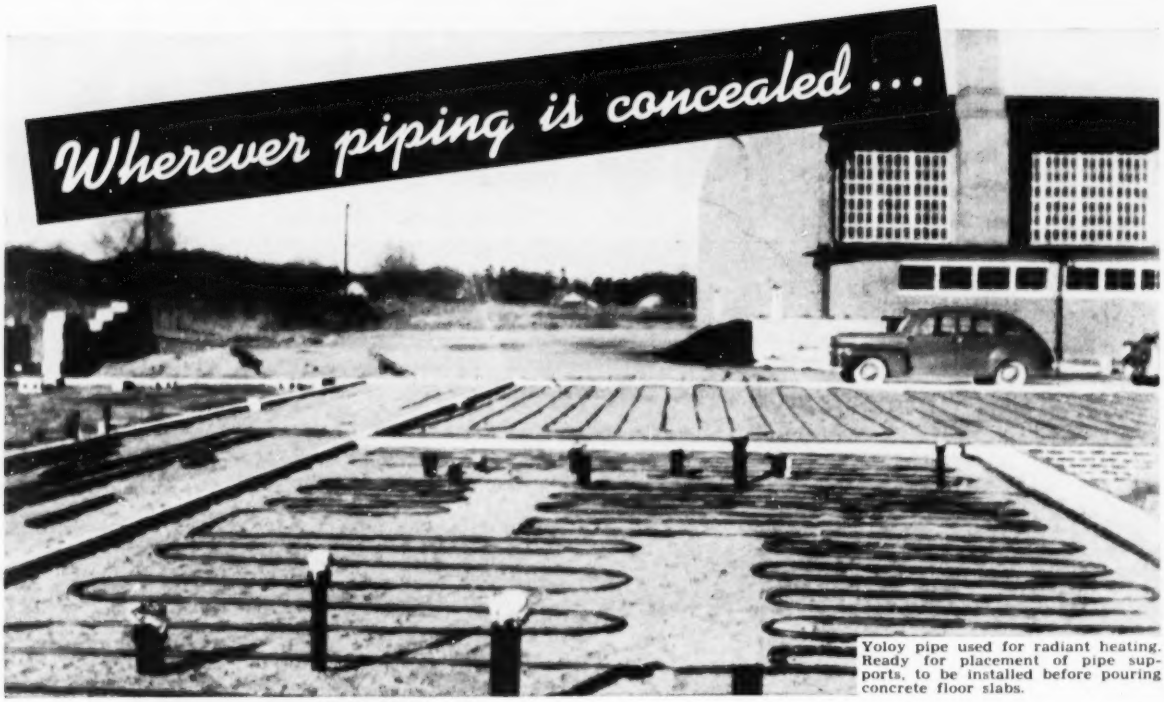

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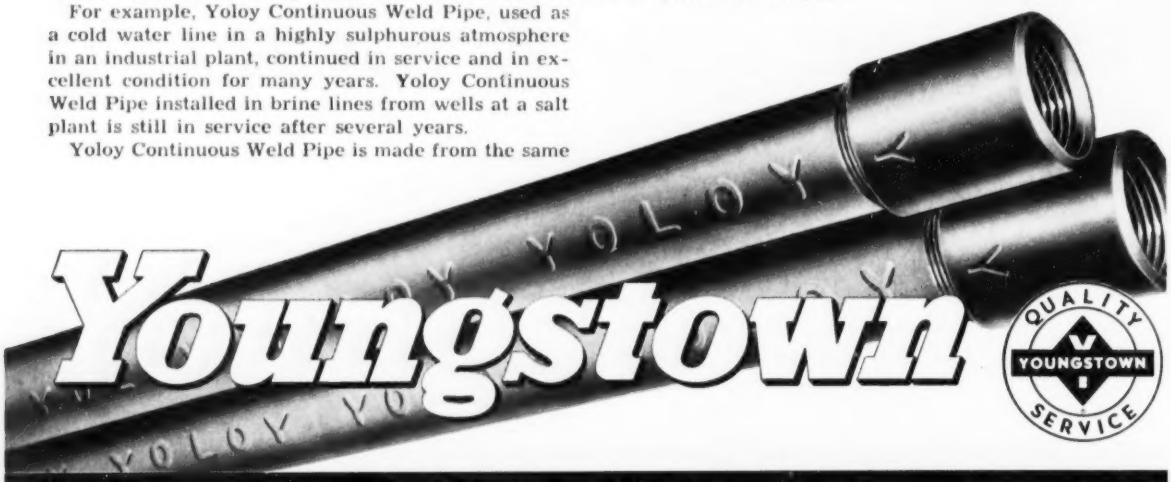

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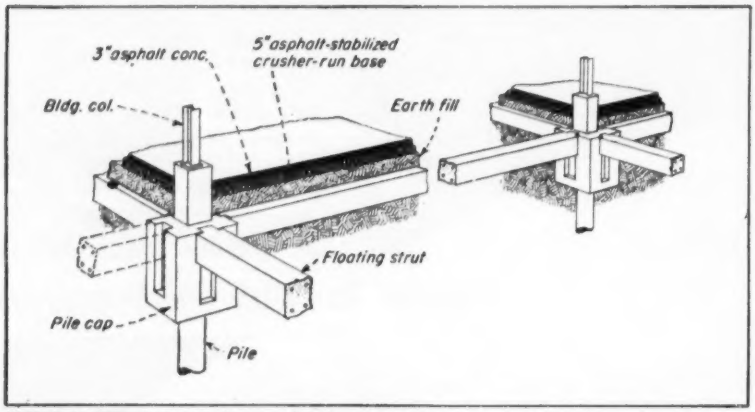

STRUTS SETTLE with floor and independent of pile-supported column footings.

Movable foundation struts settle with surrounding soil

Reinforced concrete struts bracing column footings for an Alameda, Calif., Naval Air Station warehouse are so designed that they can settle with anticipated settlement of underlying soil. This design feature was devised by Kaiser Engineers, architect-engineer on Alameda work that includes several 200x1,000-ft supply warehouses.

Soil tests indicated an ultimate settlement approaching 18 in. would occur under load. And design requirements dictated the use of struts bracing between the column footings that are on 40-ft centers. (The footings are pile supported to prevent settlement of the building). But, if the struts were to be cast monolithically with the footings—as is usually done—trouble would surely develop.

The engineers predicted that either the struts would be sheared off and settle with the floor or the floor would settle on either side of the strut and result in a waffle-like appearance. Besides that, if the struts were poured monolithically with the footings, they would have to be designed to carry the floor load as well as act as a lateral brace. Thus, a considerable reduction in size—and consequently cost—is realized.

Accordingly, Kaiser Engineers designed "floating struts." These 12-in. square beams are keyed into 8-in. slots in the vertical faces of the column footings. This will permit the struts to settle with the floor while the pile-supported column footings remain in place. The design also permitted the choice of precasting the struts or casting them in place. The latter option was chosen. Preformed expansion joint material is placed between the strut and the footings to prevent bond.

The floor has an asphaltic concrete paving that can be replaced with concrete at a later date when all anticipated settlement has occurred.

The work at Alameda Naval Air Station is under the direction of Capt. H. F. Ransford, CEC, USN, public works officer, 12th Naval District. Comdr. H. F. Curren, CEC, USN, is resident officer in charge of construction.

Kaiser Engineers is architect-engineer on a $20-million expansion program for Alameda. H. C. Shandrew is project manager. The strut detail was worked out by K. E. Olsen, design engineer.

Portugese engineer suggests some ingenious practices

Francisco de Albuquerque, general manager of Empressa de Sondagens e Fundacoes Teixeira Duarte, Ltd., Lisbon, Portugal, recently completed a 6-week tour of drilling and foundation construction jobs in the United States.

His trip included the Upper Peninsula of Michigan, the Pittsburgh area and California. In all those places he was impressed by the wide variety of fine construction methods in America and by the optimism that characterizes the economy.

De Albuquerque thought, however, that cast-in-place concrete piling operation could be performed less expensively if methods for retrieving the steel casing were adopted.

He also observed that American grouting methods were wasteful of cement: A "high-turbulence" method of placement, in use in Europe, can place sand as well as grout, so the bulk of voids can be filled with the cheaper material, and grout applied as a final seal.

In further discussing ground treatment for sealing off water, he noted a great contrast between European and American practice in the use of chemicals: In Europe it is common procedure for a variety of difficult ground conditions to be treated chemically; in the United States the chemical approach rarely is investigated. The chemicals are cheaper than cement, de Albuquerque, said.

He spent some time with the Dravo Corp. in Pittsburgh, he said because Dravo is an outstanding practicioner of the concrete caisson method. De Albuquerque's firm has developed a lightweight concrete caisson that does not depend on its weight for sinking force, but on a pull-down by block and tackle arrangements which are attached to screw piles. In some circumstances the caisson's downward movement is aided by lubricating the soil with chemical injections.

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Power for the disc comes through a pinion from a rack that is actuated by a 3-in. hydraulic ram with 15-in. stroke. The hydraulic pump moves 7 gallons of oil per minute, at a pressure of 1,500 psi. A control rod to the pump has notch-settings to establish ram-travel limits. These limits impart rotary motion to the disc in 5-deg. increments, from 5 deg to 180 deg. When the desired angle is reached hydraulic pressure is released automatically. Two bends at a time can be put into rods up to one-inch round. Inch and a quarter rods can be given single bends up to 180 deg.

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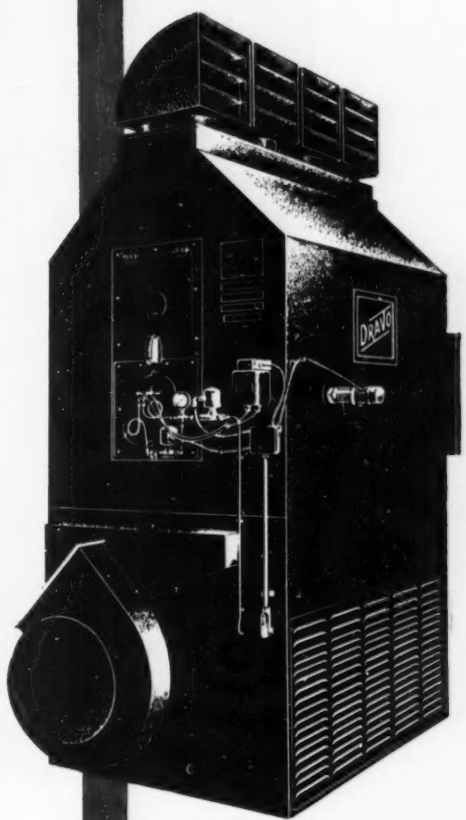

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CINCINNATI REDEVELOPMENT model illustrates first slum-clearance project for the city. Shown is Charles H. Stamm, city official in charge of urban redevelopment.

Ohio slum clearance approved

State Supreme Court rules that urban redevelopment act is constitutional

The Ohio State Supreme Court has given the go-ahead signal to cities planning slum-clearance programs under the Ohio Redevelopment Act of 1949. Work had been postponed pending a decision on the right of cities to acquire land for redevelopment purposes.

The main point was interpretation of the law providing for land acquisition for public purposes. The court decided that this law applied to urban redevelopment.

Specifically, the court ordered Mayor Carl W. Rich of Cincinnati to approve a $100,000-loan note authorized by the city council to initiate a $3-million slum-clearance project. Mayor Rich had refused to sign the note before the court passed on the act, fearing court action after work was under way. The city is now free to go ahead with plans for the project—known as Laurel 3.

• **Public purpose**—The 6-1 court decision held that an urban redevelopment project planned to eliminate slum conditions, by acquiring property and reselling it, is a taking of property for "public purpose". The court held further that "public welfare" was involved even if some of the buildings on the land to be acquired were not sub-standard, if some of the land were vacant, and if there were some incidental non-public use of the property. The resale of the property would be for redevelopment with restrictions that would insure against a recurrence of slum conditions.

Opponents contended that, according to the Ohio constitution, there must be a use, or right of use on the part of the public—which was not involved in the Cincinnati case.

The court said this position was "fallacious" and that to give this restricted meaning to the particular article of the constitution "would be to amend the section by judicial action." The first sentence of the article reads "private property shall ever be held inviolate, but subservient to the public welfare".

The court added, "We do not believe that anyone will contend seriously that the elimination of slums and other conditions of blight and provisions against their recurrence would not be conducive to the public welfare or a public purpose, and that the use of the property in doing that would not be a use for a public purpose." The case had been heard three times by the high court.

• **Two opinions**—Six of the seven judges concurred in the opinion, written by Judge Kingsley A. Taft, Cleveland. Chief Justice Carl V. Weygandt wrote a separate opinion.

The majority opinion added that the city surrendered none of its legislative powers, nor would it lend its credit to prospective purchasers of the property when it signed a contract with the federal government and borrowed money for the project. It also held that the note in question does not constitute a debt of the city.

Judge Taft also wrote "We believe that a proper construction . . . requires a decision that urban redevelopment . . . involves a purpose for which public funds can be expended and the power of eminent domain exercised."

Judge Weygandt concurred, arguing that constitutional provisions relating to tax exemption and to the right of eminent domain are different.

"To be exempt from taxation, property is required to be "'used exclusively for any public use'", he said. "'Exclusively' means solely, and in contrast, the constitutional provision relating to the right of eminent domain requires simply that 'private property shall be taken for public use'. In the absence of the word 'exclusively', it is the settled rule that a merely incidental use or benefit, will not defeat the right where there is a permanent public use of the property".

• **Plans proceed**—City officials of Cleveland and Cincinnati, with legal questions cleared, wasted no time.

Mayor Thomas A. Burke of Cleveland commented, "We now can do a real job in reconstituting the physical structure of the city, not only in housing but industrial development, off-street parking and other facilities needed to keep the city from strangling".

Cleveland's first projects will be in the central area sections known as "B" and "K". "B" will comprise 37 acres with 807 dwelling units while "K" section will include nearly 36 acres and 566 dwelling units. These will be the start of the $7-million program authorized last November.

City officials in Cincinnati—directly concerned in the test case—will go ahead with the Laurel 3 project in an area bounded by Linn, Dudley, and Liberty Streets and Lincoln Park Drive. The $3-million redevelopment will occupy about 25% of the land as opposed to the present 80% coverage.

4 powerful reasons why 1953 CHEVROLET Advance-Design Trucks give you more of what you want

MORE POWER—GREATER ECONOMY! Expect a wonderful advance in power, performance and economy in Chevrolet heavy-duty trucks! The great 1953 Loadmaster engine—standard on 5000, 6000 Series, heavy-duty and forward control models, optional on 4000 Series heavy-duty trucks—has a new high compression ratio of 7.1 to 1, develops even more horsepower than before. And the Thriftmaster engine in light- and medium-duty models brings you traditional Chevrolet economy.

TRUCKS ENGINEERED FOR YOUR PAYLOADS! Chevrolet trucks are designed for the job they will do—engineered from tires to axle, springs, clutch and power plant to do that job with the greatest efficiency and lowest cost. You don't waste money on too heavy a truck or too light a truck. You buy the *right* truck for *your* job!

MORE STAMINA! More strength where strength counts most! In 1953, all Chevrolet trucks have stronger, brawnier, more rigid frames. They have heavier, sturdier construction that means a longer, lower-cost life for your truck. And they have new larger, safer, longer lasting brakes on many models, too!

GREAT TRUCK FEATURES! In addition to the many *NEW* things you'll find in these 1953 Chevrolet trucks, you'll also find many great features yet unmatched by other makes of trucks. Features such as Flexi-Mounted Cabs, Unit-Designed Bodies, Ball-Gear Steering and many others help make Chevrolet Advance-Design trucks your greatest buy. Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load. **POWER-JET CARBURETOR**—for smooth, quick acceleration response. **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement. **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **HYPOID REAR AXLE**—for dependability and long life. **TORQUE-ACTION BRAKES**—on light-duty and medium-duty models and on front of heavy-duty models. **TWIN-ACTION REAR BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models. **CAB SEAT**—with double deck springs for complete riding comfort. **VENTI-PANES**—for improved cab ventilation. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—for easier handling. **UNIT-DESIGNED BODIES**—for greater load protection. **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

CHEVROLET

first in demand
in value
in sales

MONDAWMIN CENTER, an $8-million shopping structure planned for Baltimore, Md. It will have an area of 450,000 sq ft.

One-roof shopping center planned to be built on a 46-acre estate

Baltimore project includes many new design features but owners drop plan to build a theater on the site

One of the country's largest neighborhood shopping centers—gross store area: 450,000 sq ft—is to be built in the spring of this year in Baltimore, Md., at a cost of $8 million.

The site, formerly the estate of a Baltimore banker, covers 46 acres. Plans call for 40 to 50 stores, including two large department stores and a ten-story office building.

According to the planners the center will have many new design features.

Stores and shops will be on two ramp-connected levels and will face inward around a mall and patio.

There will be parking for more than 4,000 autos and provision for 1,000 spaces for future expansion. The edge of the site will be landscaped, and adjoining through streets will be widened.

Other features of the center include:

- All stores will be serviced from an underground truck tunnel.
- All walkways between stores will be covered.
- Drive-in parcel pickup stations will be provided at each end of the project. The customer will leave packages at one of these stations and then drive up to the station to have the packages loaded into his auto.
- Shoppers will be able to walk from parking spaces to stores without crossing any traffic ways.
- A road ringing the site at its perimeter will make access and departure easier.

Plans originally called for building a theater, but the builders dropped the idea because of television.

A common roof will cover the stores, the office building extending eight stories above this roof.

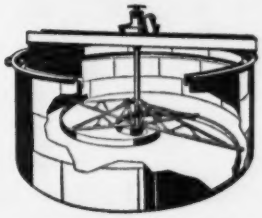
• **Designers**—Members of the board of design for the project included:

Pietro Belluschi, dean of architecture and planning at Massachusetts Institute of Technology; Wilbur Smith, associate director of the bureau of highway traffic, Yale University; Kenneth C. Welch, Michigan architect and specialist on retail merchandizing; Dan Kiley, Vermont architect and planner; Seward H. Mott, former director of the Urban Land Institute; and Palmer, Fisher, Williams and Nes, Baltimore architects.

It is estimated that more than 600,000 people live within 20 minutes driving time of the center, which is located three miles from city hall.

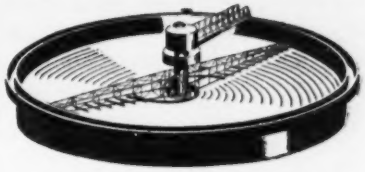
(*Municipal continued on page 60*)

THICKENERS



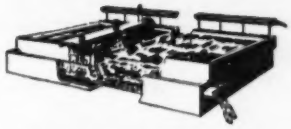
For removal or reclaiming of fine suspended solids from supply water, waste water and sewage. "Auto-Raise" mechanism prevents scraper breakage. Bulletin 31-D-55.

CIRCULAR CLARIFIERS



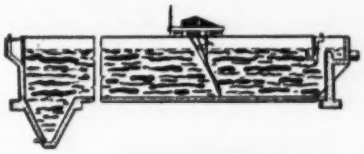
Light and heavy-duty clarifiers for water or sewage, either beam or center-column type, central sludge discharge. Bulletin 35-C-55.

AUTOMATIC BACKWASH SAND FILTERS



For high removal of non-settling or slow-settling suspended matter. Self-cleaning sand bed. No shut-down necessary for backwashing. Traveling backwash carriage. Bulletin 46-55.

RECTANGULAR CLARIFIERS



Especially suited for limited spaces or where sludge delivery is desired at one end of the tank. Particularly suited to sewage treatment, industrial wastes, and oil-water separation in refinery waste water treating. Bulletin 31-D-55.

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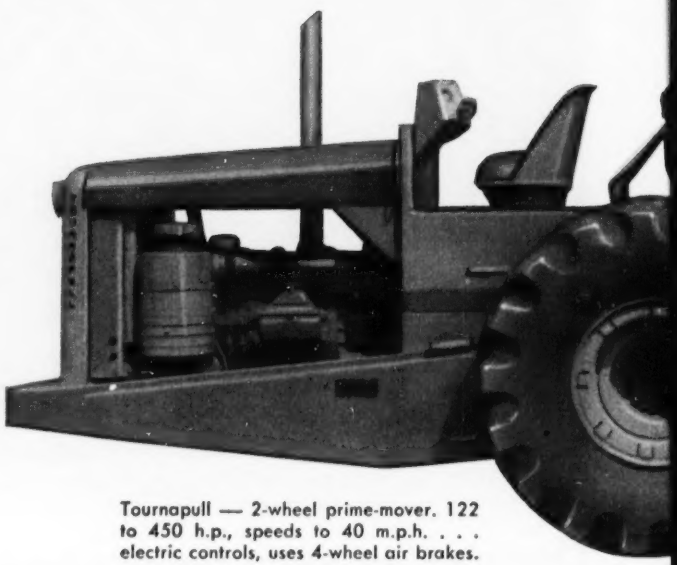
Why a 2-wheel prime-mover?

1 It utilizes full front-end weight for traction

In a *four-wheel* prime-mover, which has steerable front wheels, traction is lost by dividing front-end weight between driving and steering wheels. Sufficient weight must be placed on the steering wheels so they can change direction of unit. This robs pulling grip from drive wheels. In the *two-wheel* Tournapull prime-mover, entire front-end weight is carried by the drive wheels. As a result, Tournapull can pull through soft going or up grades at more favorable speeds, can keep going where others stall.



Tournapull — 2-wheel prime-mover. 122 to 450 h.p., speeds to 40 m.p.h. . . . electric controls, uses 4-wheel air brakes.

2 The two-wheeler, with electric steer, spots easily, gives short-radius 90° turns

Because of mechanical limitations in angling front steering wheels, the four-wheel prime-mover must turn in a wide radius. With the LeTourneau two-wheel prime-mover, electric power-steer through a geared kingpin does the steering, can quickly pivot the front-end at right angles for a short-radius 90° turn. Because of this easy maneuverability, LeTourneau units can work in restricted cuts, narrow fills . . . drive safely at high speeds over winding roads.

3 With steer on drive wheels, pull is always in line of travel . . . these powered wheels climb easily over ruts and stones

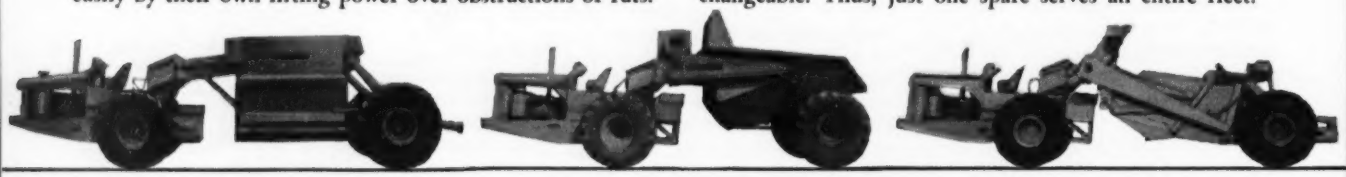
In the four-wheel prime-mover, angling front steering wheels, with wheels behind driving straight ahead, sets up stresses in steering mechanism, tires and wheels. Stones or ruts are "bulldozed" by the angling wheels turned against the direction of drive. Power is lost through the drag of these small extra wheels. With the two-wheel prime-mover, steering changes the direction of drive . . . wheels climb easily by their own lifting power over obstructions or ruts.

4 Elimination of steering wheels and mechanism cuts lubrication and maintenance

Simplification obviously favors the two-wheel prime-mover with its fewer moving parts, less friction, more effective power flow. LeTourneau machines have no unnecessary wheels, hinged axles, reach rods, steering knuckles, etc. . . . no springs, spring hangers, frame or sub-frame . . . no long drive shafts or hydraulic system. Elimination of these parts cuts deadweight and naturally saves many man-hours per week on lubrication and maintenance.

5 Entire unit needs only 4 tires, 4 wheels, all same size . . . one spare services entire fleet

With simple kingpin steering, you eliminate 2 odd-sized wheels . . . further reduce parts inventory required. All tires and wheels on a standard LeTourneau prime-mover and trailing unit are the same size and completely interchangeable. Thus, just one spare serves an entire fleet.

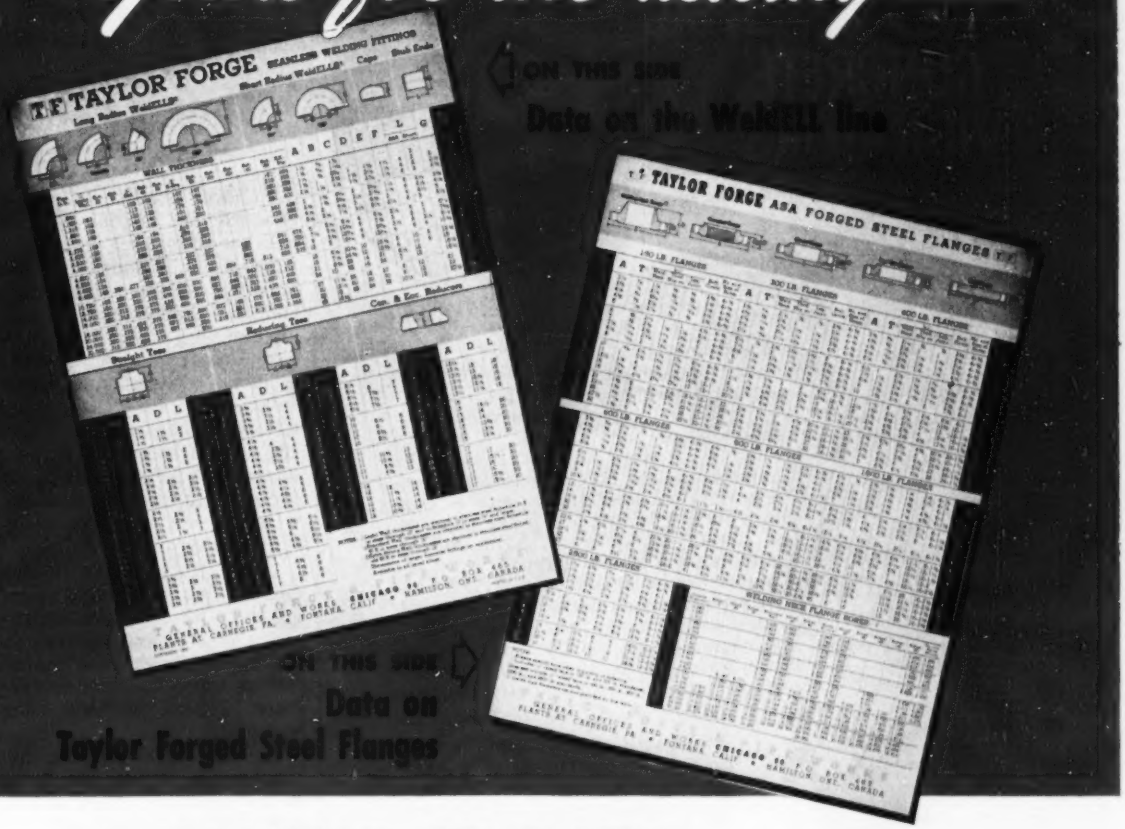


Bottom-dump Tournahoppers, 18 and 27 yds. | Rear-dump Tournarockers, 9 to 50 tons | Carryall-Scrapers, 7 to 42-yd. capacity

Tournapull, Tournarocker, Tournahopper, Carryall—Trademark Reg. U. S. Pat. Off. G-275-G-b

R. G. LeTOURNEAU, INC.
Peoria, Illinois

Yours for the asking—


TF TAYLOR FORGE SEAMLESS WELDING FITTINGS
ON THIS SIDE
Data on the WeldELL line
TAYLOR FORGE ASA FORGED STEEL FLANGES
ON THIS SIDE
Data on
Taylor Forged Steel Flanges

A VOLUME OF DATA

. . . covering welding fittings and forged steel flanges . . .

ON A SINGLE SHEET

Here is just about the handiest tool ever devised for the pipe designer. Data on welding fittings and flanges that otherwise could be found only by plowing through many catalog pages and tables have been ingeniously condensed on the two sides of the durable letter-size card illustrated above.

One side covers the broad WeldELL line of Taylor Forge welding fittings. For every nominal pipe size, ½" through 30", it shows the wall thickness for every weight of every fitting in every available material. It also shows all required dimensions of all types of fittings.

The other side covers the world's most complete line of forged steel flanges. For every nominal pipe size, ½" through 24", it gives all essential dimensional and bolting data for all types of flanges in all weights. A particularly useful table (see reproduction) is that showing welding neck flange bores which enables you to determine the I.D. of any nominal pipe size without separate calculation. Thus the sheet gives you O.D. and I.D. of any weight of pipe.

The card is varnished to make it stand the steady usage you are certain to give it. To obtain your copy see your Taylor Forge distributor or **MAIL THE COUPON.**

TF

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TAYLOR FORGE & PIPE WORKS

General Offices and Works: P. O. Box 485, Chicago 90, Ill.
Offices in all principal cities.
Plants at: Carnegie, Pa.; Fontana, Calif.; Hamilton, Ont., Canada

Please send me one of your fitting and flange sheets:

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POSITION_____

COMPANY_____

STREET ADDRESS_____

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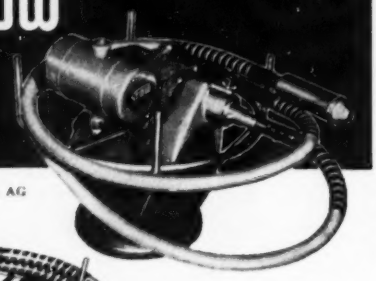
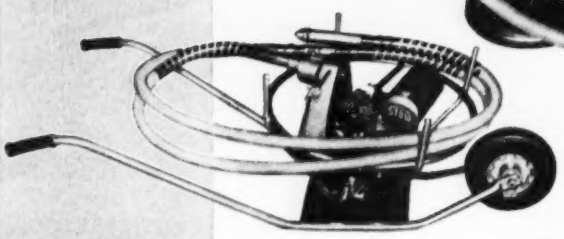
614-0353

New performance features built into STOW CONCRETE VIBRATORS



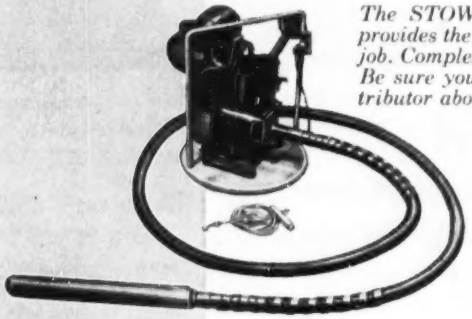
MODEL AG



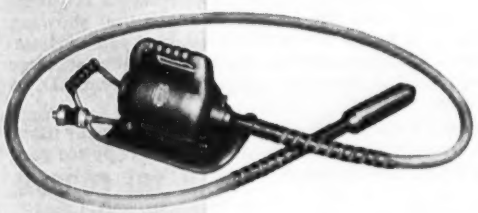
SHOWN: MODEL BGW. This is the standard STOW model BG vibrator, mounted on wheelbarrow for easy maneuverability. Model BG & BGW feature 2 HP 4 cycle, air-cooled engine; ball-bearing eccentric belt tensioner.

Contractors like STOW vibrators because the high operating speeds of this new STOW vibrator line make possible the use of heavy duty, light weight flexible shafting, and lighter, more efficient vibrator heads. And STOW design provides convenient speed control so that attachments for rubbing, grinding, cleaning may be used directly on the vibrator shafts, making it unnecessary to purchase extra shafts for this purpose.

The STOW line is complete . . . provides the right vibrator for every job. Complete accessories available. Be sure you see your STOW distributor about the STOW line!



MODEL J—The lowest priced vibrator in the STOW line. Slower speed means longer, trouble-free operation. Model J features 3600 (max.) VPM, 2 HP 4 cycle air-cooled engine, and direct drive.



MODEL BU—Features 2 HP at 9000 VPM, operates on 115 volts AC or DC with splash-proof, high speed ball-bearing motor.

See how STOW can save money for you! Send for Free Bulletin 526,

STOW MANUFACTURING CO.
19 Shear Street, Binghamton, N Y

MUNICIPAL

Milwaukee council passes off-street parking bill

The common council of Milwaukee, Wis., has moved to ease the city's parking problem by approving an ordinance requiring off-street parking space as part of various types of new construction.

Residential construction has been classified by function and different rules set up for each group:

- Single family homes and apartment buildings not more than three stories high, one parking space for each dwelling unit.
- Apartment buildings of four stories or more, two spaces for every three units.
- Rooming houses, one space for every 200 sq ft of bedroom floor area.
- Low-rent public housing projects, one space for every three units.
- Hotels, one space for every 1,000 sq ft of floor area.

Other structures affected are: Hospitals, with a requirement of one parking space for every four beds (with a minimum of four spaces); nursing homes, orphanages, and similar institutions, which will need one space for every 15 beds, but not fewer than four spaces.

The new ordinance has come under attack from architects and builders, on the ground that the new law might halt plans for apartment buildings near the city's center. They feared that the new law would make such construction too costly in the areas of high-cost land.

Pittsburgh expressway to open in March

The first stretch of Pittsburgh's Penn Lincoln Parkway will be opened to motorists some time in March. The parkway is an express highway designed to carry east-west traffic through Pittsburgh. (ENR Oct. 26, 1950 p. 35).

The unbroken seven-mile stretch which the Pennsylvania Department of Highways plans to put in operation next month runs from Wilkinsburg to Oakland. This section of the $100-million expressway will save as much as 30 minutes in traveling time between downtown Pittsburgh and the easternmost end of Allegheny County.

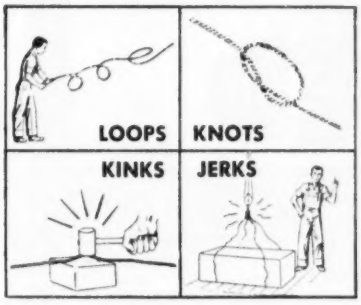
For East End residents it will mean the end of many traffic jams. The first completed section can be covered in 10 minutes without exceeding the 50 mph speed limit. The old meandering route often took up to an hour,

(*Continued on page 61*)

Tuffy

PREVENTS DAMAGE!

When These Stresses Happen To Slings



Only Tuffy gives you the 9 part machine-braided wire fabric construction that fights off knots and kinks . . . stands up longer if such stresses occur. These extra Tuffy advantages assure longer sling service that can help you save up to 40% on sling costs!

Free 3' Sling Sample!

Knot it—kink it if you can—put it to the test. See how easily Tuffy straightens out—without damage!

Free Sling Handbook!

New! Complete! Only handbook of its kind. Factual, useful data, graphically illustrated to help you cut sling costs.

Get Your FREE Sling Handbook

Contains plenty of factual, useful data on 12 braided sling types. The only handbook of its kind, and it's yours for the asking!

MAIL COUPON TODAY

UNION WIRE ROPE CORP.
Specialists in Wire Rope and Braided Wire Fabric
2228 Manchester Ave., Kansas City 3, Mo.

☐ Send FREE Tuffy Sling Handbook and Rigger's Manual.
☐ Have my Union Wire Rope Fieldman bring my free sample of Tuffy Sling.

Firm Name_____
Address_____
City_____ Zone____ State_____

depending on traffic conditions.

Five years were required to build this $34-million section of the Parkway because of limited state funds and shortages of steel and copper. More than half the cost was for the tunnels through Squirrel Hill, the biggest construction headache thus far.

• **Worst yet to come**—But the toughest construction job is still ahead of the expressway constructors: A two-mile section involving difficult engineering problems. This stretch along the Monongahela River, under the present Boulevard of the Allies and along the yards of the Baltimore and Ohio Railroad is expected to be completely under contract within the next two years.

Residents of Pittsburgh's West End and the suburbs in the South Hills will have a long wait before the western part of the parkway is finished.

The state's department of highways said it will be the end of this year before the major 9.5-mi section can be opened to traffic.

A 5-mi connection between the route of the western parkway and the new Greater Pittsburgh Airport already is in use. When the Parkway West is completed, motorists will be able to travel from downtown Pittsburgh to the airport in about 20 minutes. That's claimed to be the shortest airport hookup in any major city. The trip now takes over an hour.

The last section of Parkway West to be built will be a one-mile piece downtown. That section calls for new tunnels under Duquesne Heights and a new bridge at the Point, where the Monongahela and Allegheny rivers merge to form the Ohio River. No date has been set for completion of that stretch.

Municipal briefs . . .

• **Small package**—New Jersey's smallest low-rent public housing project, the 42-family seven-story Guttenberg Towers apartment house, was completed and occupied last week. The Y-shaped three-winged building of concrete frame and brick construction contains three, four and five room apartments.

• **Increased water supply plan**—A three-point program for expanded water works facilities in Houston, Tex., was proposed this month by Utilities Director Frank Baldwin. In his plan to reduce expected water shortages in the area, Baldwin asked: That the city drill five more wells at a cost of $500,000; that a $5-million line be built

(*Continued on page 64*)

Tuffy

Better 6 Ways On SCRAPERS

"The Best Scraper Rope I've Ever Had"

Says a Midwestern Scraper Operator
(Name on Request)

This Missouri scraper operator has learned that Tuffy Scraper Rope pays off in longer runs . . . and the owner of the company he works for knows that Tuffy pays off in lower costs! Tuffy is *specially made* for use on wheeled scrapers. It's tailored to take:

- **Greater Drum Crushing Abuse**
- **Sharper Bends Over Small Sheaves**
- **Angle Pulls Through Swiveled Sheaves**
- **Crawling on Guide Roll Flanges**
- **Heavy Line Pull . . . Rapid Line Speed**
- **Multiplied Shock of Load on Slack Line**

Tuffy Scraper Rope is ready to mount on your reel spindles. Just remember the name Tuffy, the diameter and the length. That's all you need to know to order *Tuffy!*

Send for FREE Folder on Tuffy Scraper Rope

MAIL COUPON TODAY

UNION WIRE ROPE CORP.
Specialists in Wire Rope and Braided Wire Fabric
2228 Manchester Ave., Kansas City 3, Mo.

Please send the FREE illustrated folder on Tuffy Scraper Rope.

Firm Name_____
By_____ Title_____
Address_____
City_____ Zone____ State_____

Why BRIXMENT IS WATERPROOFED

Brixment is permanently waterproofed, during manufacture, with the most effective air-entraining waterproofing agent known.

The *presence* of this waterproofing can be demonstrated by making the crater test shown in Figure 1. Its *effectiveness* in preventing the passage of water through Brixment mortar can be demonstrated by making the test shown in Figure 2.

* * * * * * * * *

The waterproofing in Brixment gives you three practical benefits which are not available in ordinary cement-and-lime mortars:

1 HELPS PREVENT LEAKY WALLS

Even under pressure, water cannot readily pass through Brixment mortar. Therefore, if the face brick are back-plastered with Brixment mortar, an effective barrier is set up against the passage of water to the inside of the wall.

2 GREATLY INCREASES DURABILITY

Water cannot readily penetrate Brixment mortar. This prevents the mortar from becoming saturated — therefore helps protect it from the destructive action of freezing and thawing to which it is subjected many times each winter.

3 HELPS PREVENT EFFLORESCENCE

Waterproofed Brixment mortar checks the passage of water and keeps it from percolating down through the wall, dissolving salts which may be in the masonry materials, and carrying them to the surface.

These advantages will be described in detail, in subsequent advertisements. Watch for them!

Louisville Cement Co., Louisville 2, Ky.

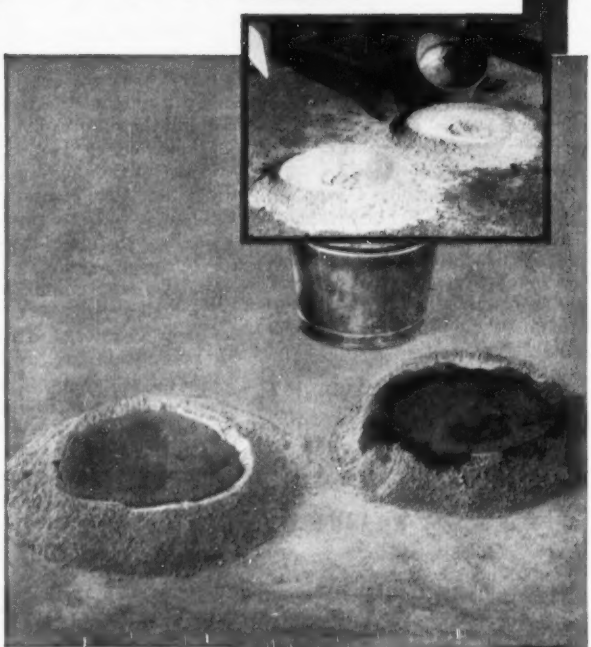
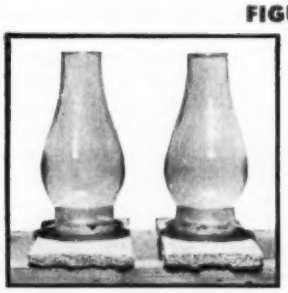


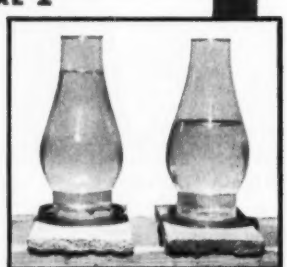
FIGURE 1

Pour out a pile of Brixment and a pile of ordinary cement and lime. Make a crater in the top of each pile. Fill each crater with water. Note how the cement-and-lime mixture absorbs the water immediately. Note how the waterproof Brixment *holds* it.

FIGURE 2



Prepare two slabs of mortar, one with Brixment and one with non-waterproofed materials. After mortars have hardened, seal a lamp chimney to each of the mortar slabs, using wax or candle grease, and fill with water.



After 24 hours, note how much water has gone into and through the non-waterproofed mortar, and how little water has gone into or through the Brixment mortar.

All these TIMKEN® bits fit the same steel!

USE Timken® rock bits and you can make one drill steel do the work of many. Timken multi-use and carbide insert bits are interchangeable in each thread series. The eight different Timken bits on this page, for instance, all fit the same steel!

With interchangeable Timken rock bits, contractors especially can sharply reduce their drill steel inventory. No need to buy new steels just because the next job calls for a different type of bit. And whether you're drilling in a mine or on a construction job, interchangeable Timken bits let you switch quickly to the most economical bit as the ground changes—right on the job.

In ordinary ground when full increments of steel can be drilled, Timken multi-use bits, with correct and controlled reconditioning, will give you the lowest cost per foot of hole.

If you hit hard and abrasive ground, you can switch quickly to Timken carbide insert bits. They're your best bet for maximum speed drilling, constant-gage holes, small diameter blast holes and very deep holes.

Be sure to have both types of Timken bits on hand and you'll have the best answer to every one of your drilling problems.

All Timken rock bits have these three important advantages: 1) made from electric furnace Timken fine alloy steel, 2) threads are not subject to drilling impact because of the special shoulder union developed by the Timken Company, 3) quickly and easily changed.

Timken rock bit engineers have 20 years' experience in solving drilling problems. Let them help you select the best bits for *your* job. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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Lightsteel

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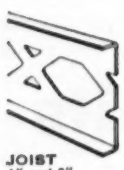
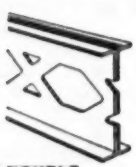
3¼", 3⅝" and 4"
16 and 14 gauge

DOUBLE STUD
3¼", 3⅝" and 4"
16 and 14 gauge



JOIST
6" and 8"
16 and 14 gauge



DOUBLE JOIST
6" and 8"
16 and 14 gauge

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... high strength to weight ratio means quicker erection, takes fewer man-hours

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MUNICIPAL

connecting the Galena Park purification plant with the city's feeder system; that in the next five or six years, the capacity of the purification plant be raised to 75 mgd.

• **Fluoridation charges**—According to a survey of the Municipal Finance Officers Assn., cost of fluoridating a city's water supply should be charged against the health function rather than against the water utility of the city. For example, Sheboygan, Wis., gave responsibility to the department of health to handle fluoridation of the city's water, while directing the board of water commissioners to make facilities available "in connection with this health program."

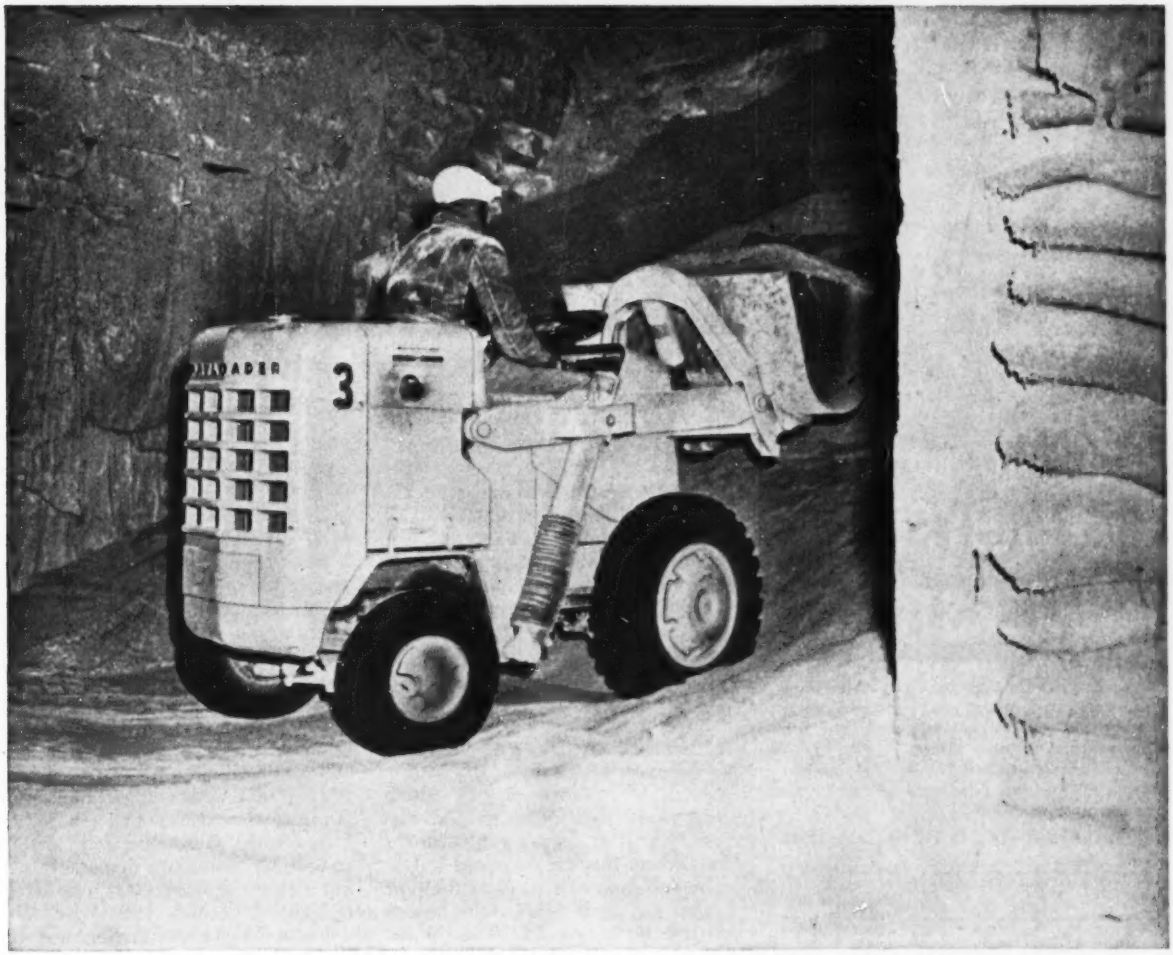
• **Hampton Roads tunnel**—The Willoughby-Phoebus route for the proposed tunnel beneath Hampton Roads, Va., (ENR Feb. 26, p. 46) has the recommendation of the Norfolk Army District Engineer. At a hearing in Norfolk, no objection to the proposed tunnel route was raised by either the Navy or commercial shipping interests.

• **"Prefab" school rooms**—The overcrowding of Toledo, Ohio, schools will be relieved partially if a plan to purchase seven prefabricated steel buildings for use as school rooms goes through. Each unit will provide two classrooms at a cost of about $11,000 per room, compared with a cost of about $35,000 per room for conventional school buildings. The proposed buildings are not a temporary measure but are expected to last for decades.

• **Cincinnati blacktopping**—A taxpayer's suit seeking to enjoin the city of Cincinnati, Ohio, from doing its own blacktopping of streets on jobs costing more than $1,000 without inviting bids was dismissed in the Common Pleas Court. The court noted that the materials used in the work are purchased through bids, and that none of the sections of the law cited by the plaintiff prohibits any municipality from performing the work involved in any municipal function.

• **Highway system endorsed**—Mayors of 25 Michigan cities recently endorsed a projected dual highway between Bay City and Toledo, Ohio, and between Detroit and Chicago. The proposed roads would cost about $250 million dollars and would be built "without cost to the state or taxpayers." Costs would be liquidated by tolls and, the roads would be turned over to the states when paid.

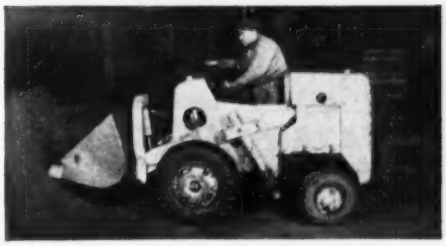
U. S. Rubber Multi-Flex Boots make equipment last longer



Note Multi-Flex Boot extended from ram plunger that lifts 12 cu. ft. bucket. The ram plunger activates the bucket to any position required for loading or unloading stone, cinders, sand.

The hydraulic actuating pistons on many types of equipment such as the tractor-shovel (above) and lift trucks are protected by Multi-Flex Boots. Made without molds by a versatile process developed by United States Rubber Company, they can do many jobs conventional boots cannot do. Multi-Flex Boots prevent scoring of pistons and damage to packing by stones, sand, cinders and other materials. They also protect against rust and corrosion.

The versatility of rubber seems to have no limits when in the hands of "U.S." technicians. They may be able to make your product last longer, or operate more economically. Write to address below.



Here the Multi-Flex Boot is compressed. The drive wheels throw quantities of stones against the boot at high velocity.

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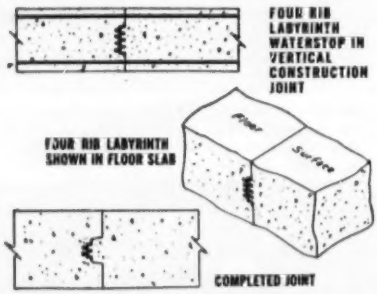

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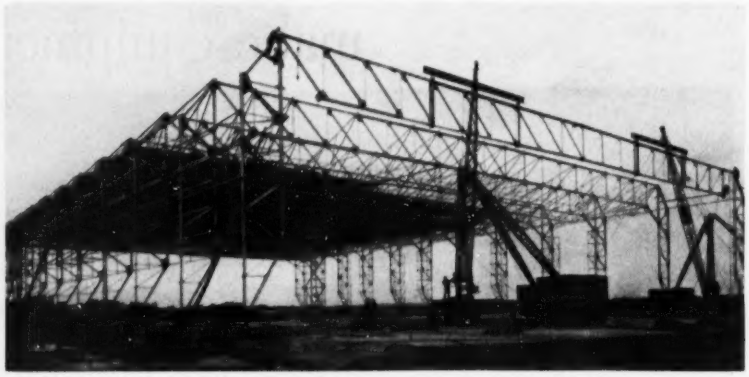


HAND CRANES erect 200-ft aluminum trusses for hangar in England.

Aluminum trusses carry hangar roof

New clear-span record set—walls, big doors, and roof are all made of aluminum

Aluminum trussed frames in the DeHavilland Aircraft Company's new hangar near London, England, span 217 ft between hinges—said to be a new record for aluminum trusses. Weighing only seven tons each, the roof trusses were prefabricated and shipped in large sections. Only two five-ton hand-operated cranes were needed for erection.

Twelve of these aluminum, trussed rigid frames, spaced 30 ft apart, support the roof and walls of the hangar. They provide a clear span of 200 ft and a clear height of 45 ft. The roof trusses are 10 ft deep, except near the knees where they are deepened to take heavy end moments. Legs of the rigid frames are 8 ft wide. Prestressed-concrete tie beams, 18x18 in. in section, take the thrust on their pinned bases.

Chord and web members of the frames consist of double bulb angles designed to preclude torsional failure. They are connected at joints with aluminum gusset plates and aluminum rivets.

• **Frame bracing**—In vertical planes, upper and lower chords of roof trusses are braced at panel points (10-ft intervals) by longitudinal, 175-lb sawtooth trusses. Horizontal wind trusses are incorporated between the roof trusses in the last three bays.

Legs on one side of the building are braced by horizontal members, the end bays being X-braced. On the other side, to give access to an adjoining building, this type of bracing could not be used. As a result the frame legs were made four-sided independent truss towers.

Frames were designed for a live load of 12 psf and wind pressure of 14 psf. The possibility of a light crane being installed at a future date was included in the design by allowing for 3-kip loads at four points along the lower chord of each roof truss.

The roof, of sawtooth construction, consists of aluminum sash and aluminimum roof deck with built-up bituminous roofing. Walls are faced with corrugated aluminum sheeting backed with insulating board and aluminum foil insulation. Ends of the hangar are fitted with motor-operated sliding-and-rolling aluminum doors that permit a clear opening 200 ft wide by 45 ft high.

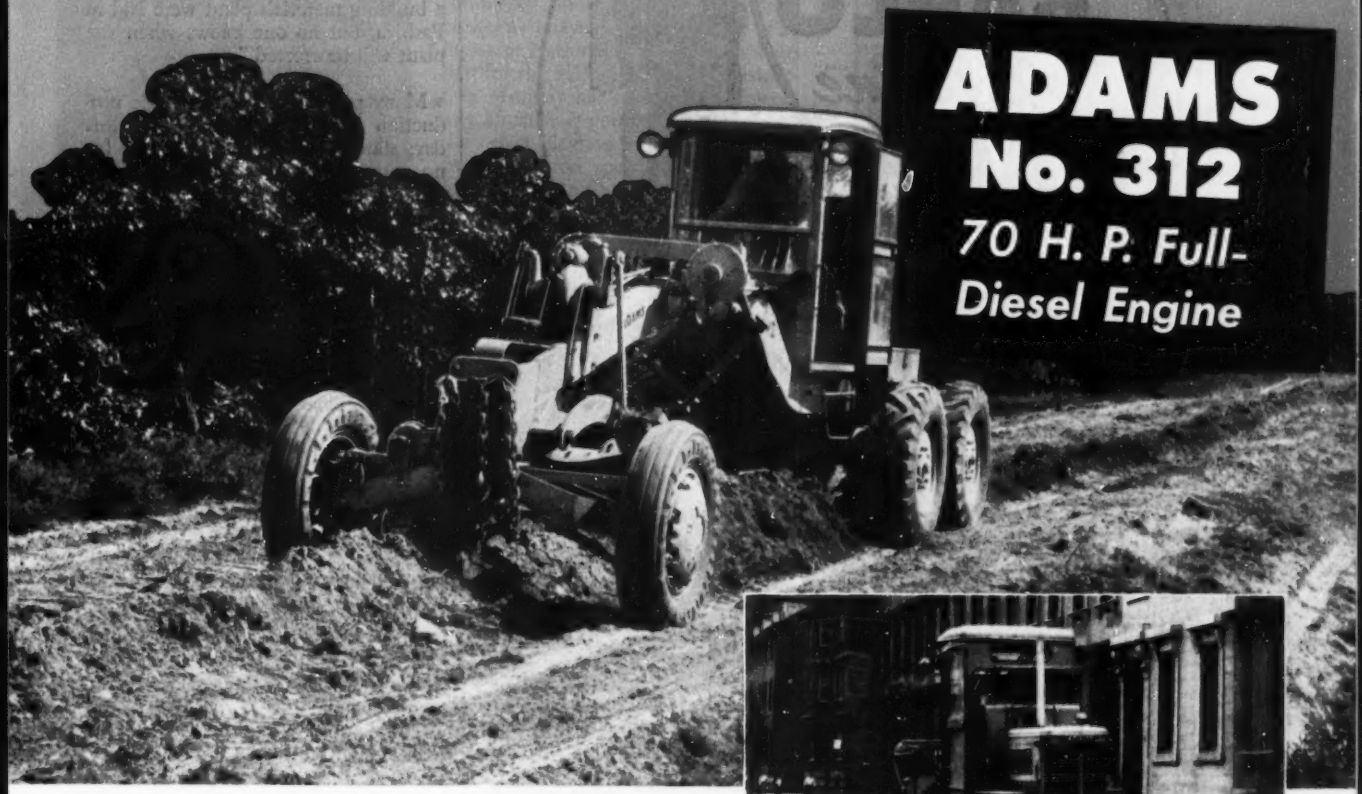
James M. Monro & Son was the architect. Structural and Mechanical Development Engineers, Ltd., was the main structural contractor and erection was by Carter-Horseley, Ltd.

Building material shortage reported in Soviet Union

Ambitious construction goals under Russia's fifth Five Year Plan may topple from the schedule because of a severe building materials shortage. In the Soviet newspaper, PRAVDA, regional administrators have accused Moscow planners publicly of falling down on the job.

In Molotov province on the west slope of the Urals, V. Poptsov, chief of the province's architectural department described the obstacles in the way of fulfilling Five Year Plan construction goals (ENR Sept. 11, 1952 p. 49) as "perfectly intolerable". "The

Looking for a Medium-Priced Motor Grader with Big Capacity? — Investigate the



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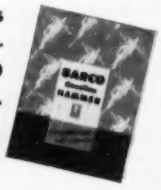
Send for a copy of this interesting new Bulletin No. 613 — "BARCO GASOLINE HAMMERS".



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GASOLINE HAMMERS AND RAMMERS

productive capacity of local building material plants is only one-half the area's requirements, especially in the case of bricks," Poptsov pointed out. "There is only one brickyard built decades ago and reconstructed in the 1930's. Five years ago foundations for a building materials plant were laid in Pashiya, but no one knows when the plant will be erected."

• **Many problems**—"Not a single production unit has been erected to this day; state funds have been spent for no purpose; and construction managers are constantly being changed," wrote Poptsov to Pravda. "The cities in the Kizel coal basin are not far apart, but there are no direct communications between them. Plans for a street car line have been abandoned, and work on a highway now under construction is moving at a snail's pace."

The regional administrator further complained, "The cities of Kizel, Ugleuralsk and Gubakha have a severe water shortage. They should receive water from a reservoir. . . ."

Record dam, port renewal top Tokyo construction

Construction of the largest dam in Japan and the renovation of Tokyo port facilities are slated for work this year by the Tokyo metropolitan government.

The dam, some 500 ft high, will be built across one of the upper forks of the River Tama where the government began construction of the largest city reservoir in the country in 1938. Dam and reservoir work could not be renewed until this year because of wartime scarcity of materials and postwar lack of funds. The reservoir will be capable of supplying over 100 mgd to Tokyo, and as a result of the artificial lake it will form, two townships in the immediate vicinity will be destroyed. The whole project is scheduled for completion in March, 1956.

Tokyo Port, expected to be turned over to municipal management by the U. S. Army in June of this year, will be enlarged at a cost of $2.3-million to make it an international port.

Dam contract signed

A $22-million contract for construction of the Ambuklao hydroelectric dam, biggest in the Philippines, perhaps in the Far East, has been awarded to the Guy F. Atkinson Company. Morrison-Knudsen's lower bid (ENR Jan. 15, 1953, p. 79) was recently turned down.

YANGTZE DAM is series of Tainter gates.

New dams on Yangtze aimed at flood control

The Middle Yangtze River flood control project reported nearing completion on the Kianghan plain in Hupeh province, China, protects some 2,000 sq mi of rice and cotton producing land from the yearly ravages of the four-century-old "Yellow Dragon" flood menace.

The project includes two dams: One gated dam about 1,100 yd long with 54 sluices on the Yangtze itself and one about 400 yd long with 32 sluices on the Hutu River for controlling the flood flow from the Yangtze and the detention basin formed by the first dam. A new dike system was built for the flood detention basin at the larger dam and is capable of storing 4.5-million acre-feet of water.

Japanese speedway blocked

The projected 325-mile superhighway between Tokyo and Kobe, (ENR Sept. 4, 1952, p. 216) has come up against an objection to its further construction. The work has not yet been completed on the first 49-mile link, between Tokyo and Gotemba. The Japanese National Railways complains that for the $20 million, the Construction Ministry has spent on the speedway already, it could have completed the electrification of the Tokaido trunk line and speeded up rail time from Tokyo to Osaka (about 20 miles from Kobe) to slightly more than six hours.

However, the Construction Ministry contends that more than half of the county highways are impassable and only 17% are paved with asphalt or concrete, in spite of which the railways carried only 138-million tons as compared with the truckers' 323-million tons of freight in 1951.

French precast houses

NATO housing project for all Allied personnel at Fontainebleau outside Paris took just eleven months from the first ground breaking and the setting up of the precasting plant to the finishing touches on the apartments themselves. Floors, walls and columns were all precast for the four seven-story buildings totaling 280 apartments. The curtain wall structures stand up on columns, leaving the ground floor space available for parking cars. Cost of the project including the casting plant was $10-million.

PAVING FREE CHINA'S RECORD BRIDGE—Spanning the 6,200-ft wide Cho-Shui-Chi River in Formosa, the recently opened Silo highway bridge is said to be the longest bridge-crossing in the Far East. The substructures for the steel-trussed spans were completed by the Japanese during the occupation of the island some thirteen years ago, and the Taiwan Provincial Government started work in 1950 for the placing of 31 U. S.-manufactured 200-ft. steel trusses.

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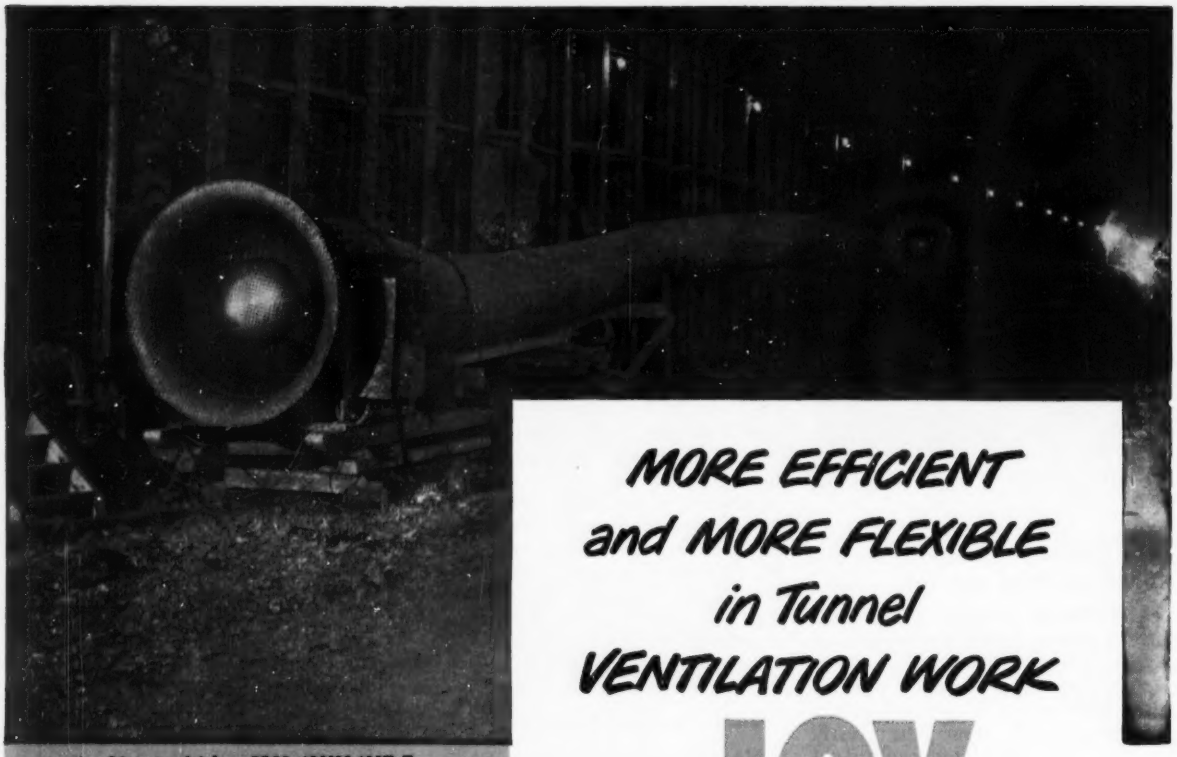
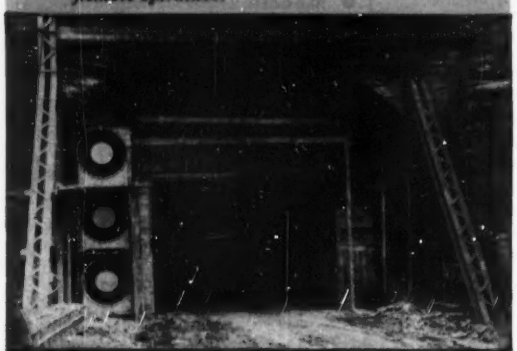


In this tunnel job, a JOY AXIVANE Fan blows air to the face through lengths of flexible Spiratube.



Typical exhaust set-up—three JOY AXIVANE Fans mounted in the entrance of one of twin bores.

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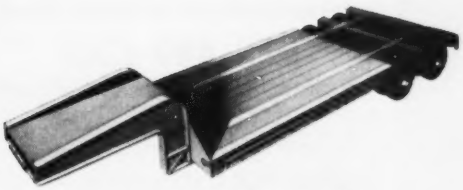
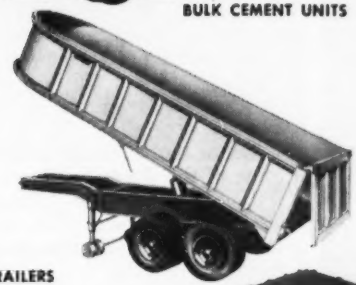
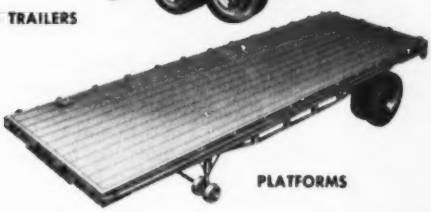


10—75 TON CARRYALLS

BULK CEMENT UNITS



DUMP TRAILERS



PLATFORMS

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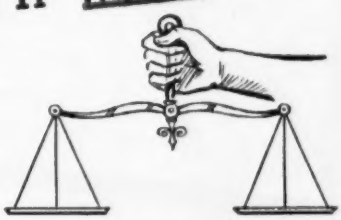
How Much Will It Cost To Operate?

Will It Do Your Job Profitably?

Is It Worth The Price?



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MEN AND JOBS

Engineer lack laid to industry

Northwestern University's Technological Institute has come up with some solutions for the increasing problem of engineer shortage. At its fifth annual college-industry conference Clarence E. Deakins, Dean of Students, Illinois Institue of Technology, said that each year the nation needs an estimated 30,000 engineers for replacement alone, but that in June, 1953, only 24,000 engineers will be graduated.

This number will decline to 17,000 in 1955.

He pointed to industry as both the cause of the shortage and the one to rectify it. "The high school graduates with mechanical skills and interests are the very boys who are attracted to the high-paying jobs in industry," Deakins said.

Dean Deakins urged that there be earlier identification of engineering aptitudes and interests among secondary-school students, and that industry increase its scholarship funds for talented students now lost to industry because they cannot afford an engineering education.

Prof. Kurt F. Wendt, University of Wisconsin, seconded this and added that industry also could help students to earn their way by increasing the number of openings, wherever possible for part-time and summer employment.

Wendt concluded that the best answer lies in a substantial expansion of the technical institute field (secondary schooling) to increase our technical forces and use our supply of engineers more effectively in work that they are equipped to do.

Titus G. Leclair, manager of engineering for Commonwealth Edison and Public Service Company of Illinois, enlarged on this theme by pointing out that the engineer should be relieved of his paper work and other nontechnical activities by giving him the help of a technical assistant, draftsman, clerk, or perhaps all three in the interest of efficiency.

Don P. Reynolds, New York engineer, noted that although starting engineers and those at the peak of the profession are being well compensated many productive men in the middle brackets have become discouraged by the failure of adequate compensatory recognition for their professional efforts.

JOHN A. VOLPE, commissioner of Massachusetts' public works department.

Massachusetts contractor named to public works post

John A. Volpe, of Winchester, prominent contractor and banker, has been appointed Massachusetts Commissioner of Public Works, succeeding William F. Callahan, resigned.

Volpe, head of the John A. Volpe Co., Malden contractors, said that his firm will not bid on or accept any state contracts during the time he is head of the Public Works Department.

A native of Wakefield, the new commissioner was graduated from Wentworth Institute in 1930. He served in World War II as a lieutenant commander in the Navy.

He is national president of the Society of American Military Engineers (ENR Feb. 5, p. 73), director of the Human Relations Center at Boston University, past president of the Associated General Contractors of Massachusetts, a director in two banks, and New England member of the national labor relations committee of the Associated General Contractors of America.

Herbert N. Eaton retires; was NBS hydraulics chief

Herbert N. Eaton, an expert in hydraulic engineering and aircraft instrumentation, retired last month as chief of the hydraulics section, National Bureau of Standards.

Eaton has held the post since 1928. In that year, he headed a group that designed a variety of hydraulic research projects.

Before joining the NBS staff in 1919, Eaton spent two years as an instructor in civil engineering at Worcester Polytechnic Institute. From 1942 to 1946, he was in charge of a special projects section for the NBS, engaged in developing the guided missile "Bat."

Born in Auburn, Mass., he received a bachelor of arts degree in civil engineering from Worcester Polytechnic Institute and later a master of arts degree in mathematics and physics from Johns Hopkins University. He holds patents for a suspended head airspeed meter for airships and fabric tension meter, and is the author of several technical papers on hydraulics and aircraft instrumentation as well as principal author of the standard book "Aeronautic Instruments."

Industrial developer gets post in Rhode Island

Laurence C. Plowman, who gained regional fame by successfully filling vacant New England shipyards and textile mills with new industries, has been appointed executive vice-president of the newly organized Rhode Island Development Co.

The company's chief function is the construction of new factory buildings for industry in the nation's smallest but most heavily industrialized state.

While other cities talked about forming development committees in 1945, Plowman went out and brought new industries into the city of Portland, Me.

His first big deal was the purchase of Portland's big West Shipyard from the War Assets Administration. Within months he had the yard's empty buildings filled with new industries. Later he did the same job on the city's East yard.

Meantime, Nashua, N. H., had a crisis on its hands because Textron Inc., had shut down, putting 3,000 persons out of work. Bankers, businessmen and private citizens formed the Nashua, N. H. Foundation and hired Plowman to run it.

Within 18 months all empty space in the former Textron mills had been filled. In the same time the foundation paid off notes, built up a cash balance, constructed a new factory—all the existing space was filled—and found another industry to occupy the factory.

Plowman is at present general manager of Textron's industrial building department.

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MEN AND JOBS

Engineer gets new post in New York City area

The election of Charles A. Richardson as a vice-president of Merritt-Chapman & Scott Corp., in charge of the company's New York Marine & Heavy Construction Division, was announced last week.

Richardson, a member of the organization since 1935, succeeds William Denny, who last month was advanced to serve as executive vice-president and general manager.

Richardson has served in the field for the last 18 years as project manager on a wide variety of major construction jobs, and most recently was in charge of M-C&S operations in the Boston area.

Recent projects he directed included: Construction of Boston's new three-berth Mystic Pier No. 1, river piers for the Mystic River Bridge; reconstruction of Dry Dock No. 1 at the Boston Navy Yard; construction of the substructure for the Hoosac Pier; foundations for bridges across the Merrimack River and Chelsea River; and construction of the new Long Island Viaduct in lower Boston Harbor.

Richardson is a native of Hingham, Mass., and was graduated from Massachusetts Institute of Technology in 1929 with a Bachelor of Science degree in engineering.

Prior to joining M-C&S, he served as an engineer with the U. S. Coast and Geodetic Survey and with the Waterways Division of Massachusetts Public Works Department.

Sanitation specialist honored at dinner

After 50 years of service with the Builders Iron Foundry division of Builders-Providence, Inc., (R. I.), Charles G. Richardson, a vice-president of the division, was honored by the company last month for his service to the water and sewage industry as well as the years of service he has given to his company.

He has invented a number of flow metering, controlling and proportioning devices. He early developed the technical formulae for the measurement of the flow of air and gas through Venturi tubes.

The author of more than 50 technical articles, his latest (in press) is "Filter Effluent Rate Control."

Among membership in many professional engineering societies, Richardson numbers a life membership in the ASCE.

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Thew-Lorain pioneered the rubber-tire crane industry in 1919. Today, Lorain is the world's largest builder . . . with more years of know-how . . . more manufacturing experience . . . and more selection. Those are the things you would expect the leader in the rubber-tire crane field to offer.

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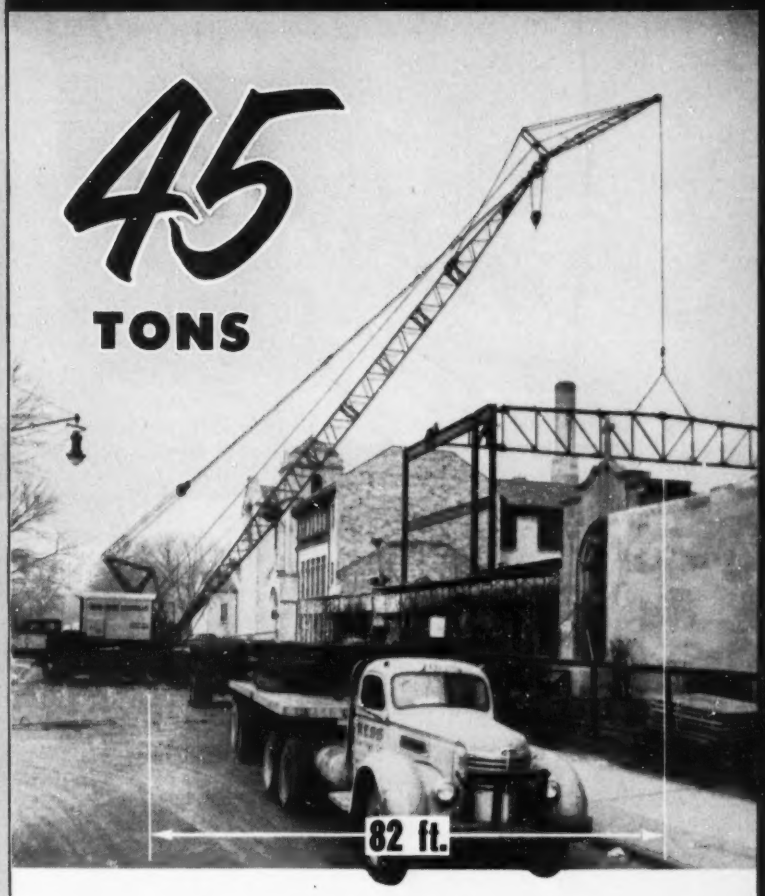

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◀ 6-Ton "TL-10" Truck-Crane — For Mounting on Your Truck

Left — This Lorain Truck-Crane, Model "TL-10", is shown mounted on a modified Autocar "4x4" chassis. It is the newest and smallest machine built by Thew-Lorain. The new "TL-10" turntable is available for field mounting on your new or used truck. In this small machine, Thew-Lorain has incorporated all of the famous Lorain quality and design features normally found in larger types. You get low first cost plus high operating efficiency in the "TL-10".

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Ask your Atlas technical representative to show you the picture presentation of the ROCKMASTER story. See for yourself how the millisecond delay electric blasting caps teamed with the ROCKMASTER system of explosives choice can give you greater blasting efficiency through complete confinement of the blast.

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Offices in principal cities

Flood control association elects engineer as head

Henry F. Hannis, who was district engineer at Albuquerque, N. M., for the Corps of Engineers, for several years after World War II, but who is now associated with the Tellyer Concrete Pipe Co., at Albuquerque, has been elected president of the Middle Rio Grande Flood Control Assn.

The privately-supported association has been working for eight years to obtain appropriations from Congress for flood control along the middle Rio valley. During Hannis' employment with the Corps, its recommendations for the project were completed and integrated with those of the Bureau of Reclamation for irrigation structures in the middle valley. The integrated plan was authorized by Congress as the Comprehensive Middle Rio Grande Project, which was to cost approximately $70 million. Only a few million dollars, however, have been actually appropriated, and those for emergency works, including a check dam on the Rio Jemez near Aubuquerque.

Careers . . .

• **Appointed**—**Wayne F. Caskey** last month became chief of the production and requirements branch, building materials division, National Production Authority. **Bruce Fowler,** who has been acting chief since last August, will continue in his former post as chief of the construction activity section in the branch . . . **Edward N. Torbert,** Bureau of Reclamation regional planning engineer at Boise, Ida., has left this country to serve as special advisor on water resource development to the Afghanistan government under Point Four . . . Head of the newly-created division of traffic and safety in Jackson, Miss., is **Arthur M. White,** assistant maintenance engineer in the State Highway department . . . **Lewis Dickerson** has joined Lockwood, Kessler and Bartlett, Great Neck, N. Y., photogrammetry firm, as a consultant. Formerly a major in the Corps of Engineers, he has been with the Army Map Service since 1945 as chief of the photogrammetric division . . . Named manager of Lockwood Green Engineers, Inc., Boston office is **John R. Porter** . . . New adviser to the School of Engineering, University of Puerto Rico, is **Dean S. S. Steinberg** of University of Maryland's college of engineering.

• **Elected**—The Atomic Energy Commission's Advisory Committee on Industrial Information last month elected as its chairman **S. D. Kirkpatrick,** a vice-president of the McGraw-Hill Book Company . . . Re-elected for a third term as president of the New York City Building Trades Employers' Association is **Fred J. Driscoll,** president of George F. Driscoll Co. . . . For the second consective year, **G. J. Casey** was elected president of the Metal Lath Manufacturers Association at the group's annual meeting in Cleveland. . . The Construction Industry Employers' Association, an organization of industrial construction concerns in the Buffalo, N. Y. area, elected **Cyrus S. Siegfried** president. . . **R. A. Anderson** has been chosen president of the Master Builders' Association of Milwaukee. . . Officials of Ford, Bacon & Davis, Inc., have announced the election of **David A. Uebelacker** as senior vice president of Ford, Bacon, & Davis Canada Ltd., Toronto.

To head the Mississippi Road Builders Association in 1953 is **R. W. Hyde** of Jackson . . . Members of the Toledo Building Congress last month named as their president **Fred W. Entenman . . . Adelbert C. Eichenlaub, H. Lyle Henson** and **Merko M. Sepic** have been designated vice presidents of the Peerless Cement Corp., Detroit . . . Newly elected chairman of the Truck Mixer Manufacturers Bureau, National Ready Mixed Concrete Association, is **Otis H. Manchester, Jr.,** St. Louis . . . **James J. LaSalvia** will head the Osborn Engineering Co., Cleveland.

• **Honored**—The Building Contractors' and Mason Builders' Association of New York City at a meetting last week presented a parchment scroll to **John H. Eisele** as a tribute to his leadership during his two-year term as president. . . **Edward J. Squire,** retired head of civil engineering at Brooklyn Polytechnic Institute, has been awarded the Cross of Lorraine by the French Order of Chevaliers de la Croix de Lorraine et des Compagnons de la Resistance.

• **Announcements**—**William A. Chalkley,** former plant engineer with Rohm and Haas Co. has joined the firm of Cooper and Perry, Knoxville. The new firm will be know as Cooper, neers . . . **Bengt F. Friberg** has entered practice as a consulting engineer in St. Louis . . . **Thomas Wilson,** Raleigh, N. C., **John R. Wilson** and **A. D. Ward,** both of New Bern, N. C., have formed **Thomas Wilson and Co., Inc.,** of Raleigh, engineers and contractors.

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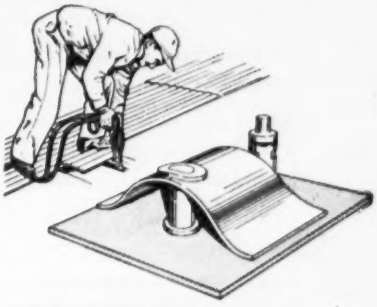

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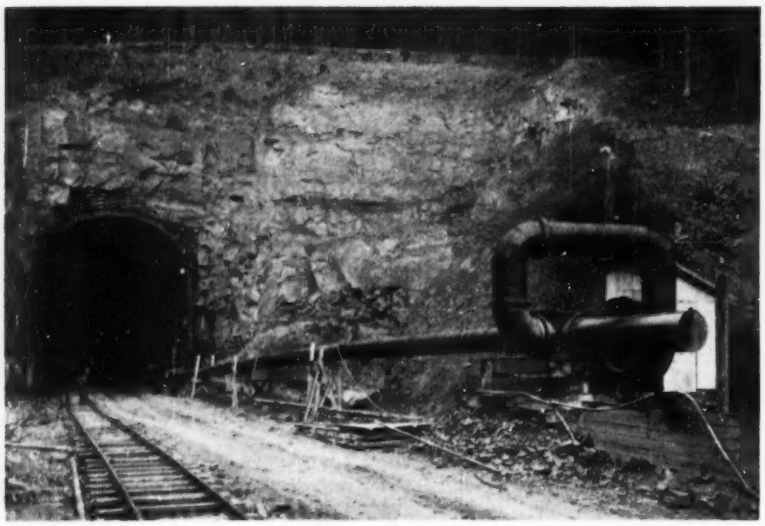

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OBITUARIES

George J. Bischof, 86, retired civil engineer, who was responsible for the lay-out of many streets in The Bronx and Brooklyn, New York City, died in Brooklyn Feb. 25. He was an 1884 graduate of the City College and took postgraduate work in civil engineering. In 1887 he worked for the city as a designer of the Washington Arch Bridge over the Harlem River, and the next year on new locks for the Erie Canal. From 1918 to his retirement in 1936 he was with the Brooklyn bureau of sewers.

John D. Matheson, 73, civil engineer, died at Hawthorne, N. Y., Feb. 26. He was a graduate of Cooper Union and had worked for the N. Y. Central R.R. In the second world war he was with the Reconstruction Finance Corp.

Dexter P. Nichols, 33, with the engineering firm of Metcalf & Eddy, and youngest son of ex-Mayor Malcolm E. Nichols, of Boston, died recently in Natick, Mass. He was a graduate of Boston Public Latin School and Harvard College, class of 1941.

Henry W. Dawson, 69, St. Louis city street commissioner since 1941, died Feb. 15. A member of the American Public Works Association, he served the city for many years as supervisor of its asphalt plant before being appointed street commissioner.

Henry J. Heinz, 59, engineer and contractor, died at Louisville, Ky., Feb. 22. He attended the University of Wisconsin and was with the Army Corps of Engineers in Panama during the first world war.

John Lee Berry, 68, former Kitsap County engineer and city engineer at Bremerton, Wash., died there Feb. 19. He served as a major with the 212th Army Engineers in the First World War and was a consulting engineer for war housing projects in the Puget Sound area during World War II.

T. J. Poggiani, 49, construction engineer and public works officer at the Naval Reserve armory, Anderson, Ind., died Feb. 22. A Notre Dame University graduate, he started with the Pennsylvania highway department; and late was with the Indiana Highway Commission, and was a partner in Pierce & Gruber. He was a lieutenant commander in the Seabees in the Pacific in the second world war.

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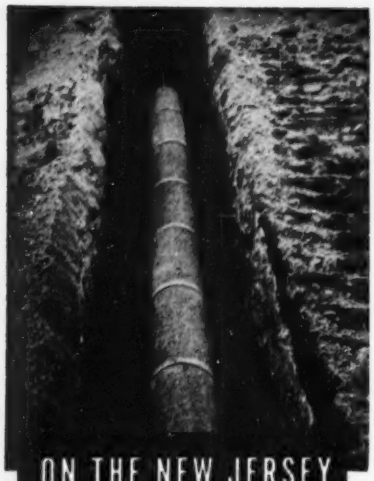

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LEGAL

Construction of contracts

The New York Supreme Court in a recent case[1], in discussing the construction to be given to ambiguous contracts made the following comments:

"Generally speaking, the cardinal rule in the interpretation of contracts is to ascertain the intention of the parties and to give effect to that intention if it can be done consistently with legal principles. It has been said that to this paramount rule all others are subordinate. The parties should be bound for what they intended to be bound for, and no more.

"The rule in ethics is, that when the terms of a promise admit of more senses than one, the promise is to be performed in that sense in which the promisor apprehended at the time the promisee received it, and this is the established rule of law, as well as in morals. In the language of the books, it is to be interpreted in the sense in which the promisor had reason to suppose it was understood to the promisee.

"It has been many times held that the practical construction put upon a contract by the parties to it is sometimes conclusive as to its meaning.

"There is no surer way to find out what the parties meant, than to see what they have done."

On the same general subject, other courts recently have made the following comment:

"Where a contract is capable of a construction in accordance with justice and fair dealing, the court will adopt such construction, instead of a construction which will entail loss on a party to the contract."[2]

"Where a contract is made with a purpose by the parties to it that it shall be performed in a particular place, its validity and interpretation are to be determined by the law of the place where it is to be executed. It is made with a view to that law."[3]

"A contract should be considered as an integrated instrument having a central theme or subject matter. It has numerous provisions, conferring rights and casting corresponding liabilities upon the parties thereto. Words which standing by themselves have an ordinary and generally accepted meaning may acquire special significance in light of the general subject matter and purpose sought to be accomplished by the execution of the contract. It is for that reason that we generally look to the four corners of a written instrument and consider it in its entirety in construing and determining the rights and liabilities arising thereunder."[4]

(1) Ward v Coward, 112 N.Y.S. 2d 628.
(2) United States v Southern Gulf Lumber Co., 106 F. Supp. 815.
(3) Wethereil Bros. Co. v United States Steel Co., 105 F. Supp. 81.
(4) United States v Mann, 197 F. 2d 39.

Building plans that violate zoning laws

An architect cannot recover for services rendered in drawing plans and specifications on a designated lot, where the plans prepared did not conform with set-back restrictions of a city zoning ordinance and where the architect did not offer to change the plans and specifications or redraft them and where there was no claim that the owner directed the architect to prepare the plans in the manner in which they were prepared.[1]

The court in its opinion, quoting from two legal authorities, stated:

"Nor can an architect employed to draw plans and specifications for a building on a particular lot recover compensation if he produces plans for a building which, because of municipal building regulations, cannot be erected on the lot specified." (3 American Jurisprudence, page 1007.)

"If an architect knows the place where it is intended to erect the building he must know the building restrictions of that particular place and must draw the plans and specifications accordingly or else forfeit his right of recovery for his services. So the architect cannot recover for his plans and specifications where the building, if erected in accordance with them, would violate the building ordinances of the place at which it is to be erected unless he has been directed by the owner so to prepare them." (6 Corpus Juris Secundum, page 308.)

In one of the leading cases on this subject, the court in its opinion stated:

"An architect is an expert in his particular field of work. He so holds himself out and is employed because he is such. He is not only bound to know the character of materials necessary to the construction of a safe and durable building of the design required, but is bound to know the building restrictions imposed by the law of the place where he is informed the building is to be erected."[2]

(1) Bott v Moser, 7 S.E. 2d 217.
(2) Bebb v Jordan, 111 Wash. 73, 189 P. 553.

(*Continued on page 81*)

Damages recoverable for defective work

In a recent action[1] brought to recover damages resulting from defective performance of a contract, the court in its opinion, in discussing the damages recoverable, stated: "The defendant [contractor] contends that the measure of damages is the difference in market value of the property immediately before and after the injury. This is the rule with respect to personal property. It is not generally applied to actions growing out of real estate building contract cases. In the written contract which was entered into the defendant agreed to perform the work in a 'substantial and workmanlike manner.' Whether or not this was done was issue in the case. In Vol. 123 A.L.R. p. 520, a statement with respect to the measure of damages in such cases is as follows:

" 'In almost all, if not in all, of the jurisdictions in which the precise point has arisen, cost of correction or completion rather than loss in property value ordinarily affords the proper basis for measuring the damages which result to the owner from the breach of a building or construction contract, or other contract to change the condition of real property. The propriety of applying such measure of damages is especially clear where correction or completion would not involve unreasonable destruction of work done by the contractor and the cost thereof would not be grossly disproportionate to the results obtained.'

Numerous cases are cited [in that text] from various states of the Union. No case is cited from Ohio. However, in Vol. 13, Ohio Jur. p. 100, the text is as follows:

" 'In fixing the measure of damages recoverable against a building contractor who has so negligently done his work that the parts built by him are useless, the jury are at liberty to take into their estimate of the injury the money paid out to put the building in the condition it would have been in, if the work had been well done; also, the inconvenience and interruption of the plaintiff in the enjoyment of the premises, the loss of its use, the injury to the furniture, and whatever else entered into the injury actually sustained, and also the expense of obtaining legal redress.'

"In support of the text the case of Somerby v. Tappan, Wright, 229, 570, is cited."

(1) Sader v Bromberg et al., 106 N.E. 2d 306 Court of Appeals of Ohio, Oct. 11, 1950.

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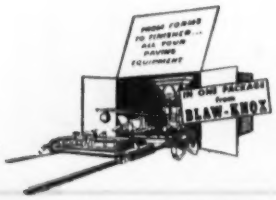

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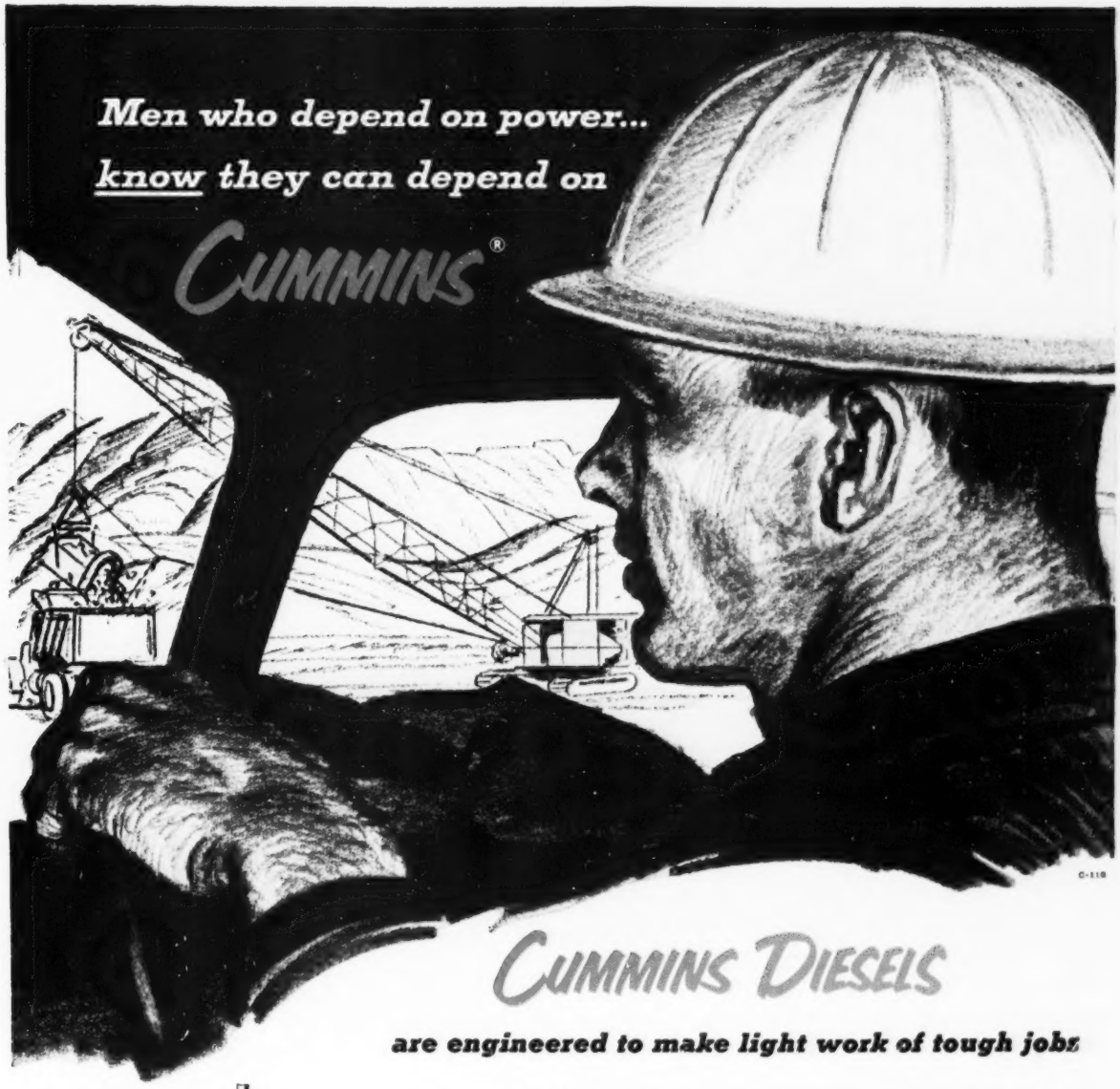

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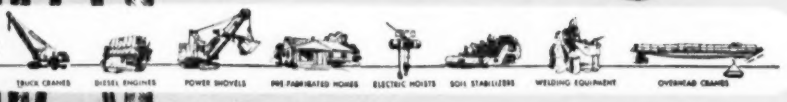

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BOOKS

Elasticity and plasticity

ELASTICITY IN ENGINEERING—By Ernest E. Sechler. 419 pp. John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y.; Chapman & Hall, London. $8.50.

THEORY OF ELASTICITY AND PLASTICITY—By the late H. M. Westergaard. 176 pp. Harvard University Press, Cambridge, Mass.; John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. $5.

Though they deal with the same general subject, the two authors treat it differently. Mr. Sechler develops the basic differential equations of the theory of elasticity from considerations of geometry, equilibrium and compatability of strains. Mr. Westergaard employs vector analysis.

"Elasticity in Engineering" is the second volume in a series dealing with structural analysis and elasticity sponsored by the Guggenheim Acronautical Laboratory, California Institute of Technology. Its object is to present the fundamental theories of stress and deformation of loaded elastic bodies.

In carrying out this aim, the author assembled in the first part of the book the fundamental equations and assumptions underlying the theory of elasticity. The equations are given in Cartesian, cylindrical and spherical coordinates for wide applicability to the solution of problems. The second part of the book tackles problems of stable structures, shows where exact solutions are possible and indicates types of approximate solutions. Finally, the third part of the book deals with unstable elastic structures.

Mr. Westergaard's book presents some powerful tools for the solution of elastic problems not found in ordinary texts on the theory of elasticity; but it barely touches on the subject of plasticity, despite the title. The author included plasticity in the book because he felt that solutions to problems in elasticity and plasticity had much in common.

Topics covered include equations of stress and strain, stress and strain tensors, simplest laws of plasticity, strain potential, Galerkin vector (a vector whose components are strain functions defining stresses), and twinned gradient (a mathematical operation useful in evaluating the effect of changes in Poisson's ratio). There is also a chapter on the history of the theory of elasticity, which offers an excellent insight into the significance of the concepts. The author died before he completed the book, and as a result, a treatment of three-dimensional problems that he had planned there.

NEW ENGINEERING BOOKS

FOUNDATION ENGINEERING—By Ralph B. Peck, Walter E. Hanson, and Thomas H. Thornburn. 410 pp. John Wiley & Sons, 440 Fourth Ave., New York 16, New York. $6.75.

INTRODUCTION TO HYDRAULICS AND FLUID MECHANICS—By Jacob O. Jones. 403 pp. Harper & Brothers, 49 East 33rd St., New York 16, N. Y. $6.00.

STATICALLY INDETERMINATE STRUCTURES, Their Analysis and Design—by Paul Anderson. 318 pp. The Ronald Co., 15 East 26th St., N.Y. 10, N.Y. $7.50.

STATICALLY INDETERMINATE STRUCTURES—By Chu-Kia Wang. 424 pp. McGraw-Hill Book Co., 330 West 42nd St., New York, N. Y. $7.50. 50-year index to A.S.T.M. technical papers and reports—216 pp. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $6.00.

ANALYTIC MECHANICS—Third Edition. By Virgil M. Faires, and Sherman D. Chambers. 540 pp. The Macmillan Co., 60 Fifth Ave., New York 11. $6.00.

AN APPROACH TO URBAN PLANNING—Edited by Gerald Breese and Dorothy E. Whiteman. 147 pp. Princeton University Press, Princeton, N. J. $2.00

HIGHWAY RESEARCH BOARD—Volume 31—Proceedings of the Thirty-First Annual Meeting. 690 pp. National Research Council, Highway Research Board, Washington, D. C. $7.50.

I REMEMBER—By the late Dexter S. Kimball. 259 pp. McGraw-Hill Book Co., 330 West 42nd St., New York, N. Y. $4.00.

THE LOOK OF MAPS—By Arthur H. Robinson. 105 pp. The University of Wisconsin Press, 811 State St., Madison, Wis. $2.75.

WILLIS HAVILAND CARRIER, FATHER OF AIR CONDITIONING—By Margaret Ingels. 170 pp. Country Life Press, Garden City, Long Island, N. Y. $2.50.

THE AMERICAN CITY—By Stuart A. Queen and David B. Carpenter. 383 pp. McGraw-Hill Book Co., 330 West 42nd St., New York, N. Y. $5.50.

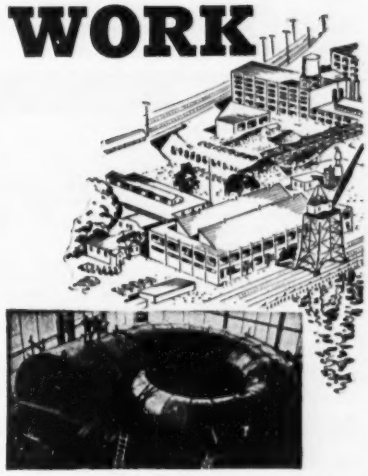
SIMPLE EXAMPLES OF REINFORCED CONCRETE DESIGN—Fourth Edition. By Oscar Faber. 90 pp. Oxford University Press, 114 Fifth Ave., New York 11, N. Y. $2.00.

2020 REVIEW QUESTIONS FOR SURVEYORS, Third Edition. By Russell C. Brinker. 149 pp. May be obtained from Russell C. Brinker, Box 153, Blacksburg, Virgina. $3.00.

STATISTICS WITH APPLICATIONS TO HIGHWAY TRAFFIC ANALYSIS—By Bruce Greenshields and Frank Weida. 238 pp. The ENO Foundation for Highway Traffic Control, Saugatuck, Connecticut. Limited free distribution.

PROCEEDINGS OF THE SECOND MIDWESTERN CONFERENCE ON FLUID MECHANICS—Bulletin No. 149. 529 pp. The Ohio State University Engineering Experiment Station, Columbus, Ohio. $6.00.

STEEL PLATE WORK



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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y
ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† **Me., Presque Isle**—ROADS—B. A. 3/19—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston, Mass., repairs to roads, bit. concrete pavement, apply seal coat of cut-back asph. with stone aggregate cover, clean and shape existing ditches, concrete headwalls, Presq Isle Air Force Base, NOY 75854, Spec. 36632. Plans deposit $10.

BIDS ASKED—BUILDINGS

Conn., Fairfield—SCHOOL—B.A. 3/17—Town Bldg. Comn. Purch Auth., Town hall, elementary school Fairfield Woods Area. Plans deposit $25. Lyons & Mather, 211 State St., Bridgeport, archts.

▲ **Mass., Boston**—GARAGE—B.A. 3/27—City Boston Real Estate Comn., City Hall Annex, Unit 4, leasing of public parking garage Pearl, Congress, Milk and Franklin Sts. $2,250,000. Plans deposit $100. (First Municipal Parking Corp. refused to go thru with contract and forfeited $10,000 bond). CD 2/20, under CA.

▲ **Mass., Natick**—SCHOOL—B.A. 4/8—Town, Supt. Schools, S. Main St., Senior High School. $3,500,000. Plans deposit $150, refundable. Shepley, Bulfinch, Richardson & Abbott and Smith & Sellew, 1 Court St., Boston, archts. Merrill Assoc., 210 South St., Boston, htg. and vent. engrs. Edwin P. Mahard, 473 Statler Bldg., Boston, elec. engr. CD 2/18.

BUILDINGS

LOW BIDS AND CONTRACTS

Power Piping Corp., 46 First St., Cambridge, Mass., LB $100,218, POWER PLANT imprvs., incl. equip., State Hospital Proj. No. 0-615, CONCORD, N. H. State Dpt. P. Wks. & Hys., State House, Concord, N. H. Bids Feb. 20. CD 2/11.

▲ **Gilbane Bldg. Co.,** 90 Calverly St., Providence, R. I., LB, **$1,254,000,** combined bids on Oak St. SCHOOL and West Side SCHOOL;
Westcott Constr. Co., 52 N. Washington St., North Attleboro, Mass., LB. **$415,000,** elementary SCHOOL Oak St.; LB. **$889,500,** West Side Elementary SCHOOL, TAUNTON, MASS. City P. School Dpt., office, Harold H. Galligan, Supt. Schools, Cohannet School, Taunton, Mass. Bids Feb. 25. CD 1/13.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

† **N. J., Wrightstown**—STORAGE, etc.—B.A. 3/27—U. S. Eng., 121 N. Broad St., Phila., Pa., ordnance storage and repair shop, McGuire Air Force Base, ENG-26-109-53-455. $100,000. Extended date. Erwin Gerber, 11 Commerce St., Newark, engr. and archt.

† **New York**—B.A. 4/1—U. S. Eng., 80 Lafayette St., New York, Zone 13, clearing and snagging of Esopus Creek, vicinity of Shandaken and Mt. Trempler, Serial No. CIVENG 30-075-53-43. $50,000. Plans deposit $5.

N. Y., Jones Beach—PARKING FIELD—B.A. 4/11—Long Island State Park Comn. at Administration Headquarters, Belmont Lake State Park, Babylon, enlarging Overlook Parking Field No. 2, Jones Beach State Park, near Wantagh. CD 8/16/44.

BIDS ASKED—BUILDINGS

Pa., Phila.—CONVENT—Bids Asked—St. Raymonds Roman Catholic Church, 7973 Williams Ave., convent. $300,000. Gleeson & Mulrooney, 1612 Market St., archts. CD 1/10.

SOON LETS CONTRACT—BUILDINGS

Pa., East Stroudsburg—MFG. PLANT—Line Material Co., East Stroudsburg, soon lets contract, mfg. plant addn. $250,000. Rinker & Kiefer, Stroudsburg, archts.

Pa., Phila—WAREHOUSE, etc.—Owner c/o Joseph J. Funston, 1324 Park Ave., soon lets contract, warehouse and office. $82,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,
Ell-Dorer Contg. Co., 644 Nye Ave., Irvington, N. J., CA, **$1,328,554,** paving, bridges, retaining walls for Sections 3A and 1K of Route 25A from D. L. & W. R.R. to High St., 0.574 mi. Newark, Essex Co. Bids Jan. 23, awarded Feb. 20. CD 1/28, under LB. 3/12/53.
NEW JERSEY—N. J. Hy. Auth., State Hy. Dpt., Office Bldg., 1035 Parkway Ave., Trenton,
Union Bldg. & Constr. Corp., 631 Main Ave., Passaic, N. J. LB, **$658,909,** grading, drainage for Section 7 Garden State Parkway from Chevalier Ave. to Raritan River bridge, Contract 18, Sayreville, Middlesex Co. Bids Feb. 26. CD 2/9.

▲ **NEW JERSEY**—N. J. Hy. Auth., State Hy. Office Bldg., 1035 Parkway Ave., Trenton,
Tully & Di Napoli, P.O. Box 145, Flushing, N. Y., LB, **$4,059,316,** Contract 15, structures, grading, paving, drainage for Section 4 of Garden State Parkway from Mill Rd. to Nye Ave., Hillside Twp., Union Co. and Irvington, Essex Co. Bids Feb. 19. CD 2/2.
Massett Bldg. Co., 212 N. Georgia Ave., Atlantic City, N. J., LB, **$329,800,** substructure and decking and reconstr. garden pier (Sect. 2 of $2,000,000 project), ATLANTIC CITY, N. J. Bd. City Comrs., City Hall, Atlantic City, N. J. W. G. Stevens, Jr., 225 S. 15 St., Phila., Pa., engr. J. Vaughn Mathis, Guarantee Trust Bldg., Atlantic City, N. J., archt. CD 5/12/50.
† **American Dredging Co.,** 12 S. 12 St., Phila., Pa., CA. **$199,300,** dredging Trash Wharf and at Naval Shipyard, NOY 77441, Spec. 37960, PHILA., PA. Dpt. Navy, Phila., Naval Base, Phila., Pa. Bids Feb. 17.
▲ **D. C., Wash.**—District of Columbia, Director of Hys., District Bldg., 14 and E Sts. N.W., Wash., Zone 4,
Alexander & Repass, 309 Security Bldg., Des Moines, Ia., CA, **$845,955,** Pennsylvania Ave. R.R. Bridge. Bids Feb. 11. CD 2/17, under LB.
James Julian, Elsmere, Del., CA, **$119,563** sewer lines, Windsor Hills, etc., WILMINGTON, DEL. New Castle County Levy Court, Municipal Bldg., Wilmington, Del. Bids Feb. 3. CD 1/21.

BUILDINGS

LOW BIDS AND CONTRACTS

Brook Gardens, Inc., Woodlawn Terrace and Cedar Ave., Collingswood, N. J., Separate Contracts. **$700,000** RESIDENTIAL DEVELOPMENT, Woodlawn Terrace and Cedar Ave., COLLINGSWOOD, N. J. Frank W. Hall, 503 4 Ave., Haddon Heights, N. J., archt.
Meadowbrook Corp., c/o Ben Fineman, 121 S. Broad St., Phila., Pa., Separate Contracts. **$300,000** RESIDENTIAL DEVELOPMENT, Finlow and Rogers Ave., PENNSAUKEN, N. J. Edward A. L. Cox, 709 Market St., Camden, N. J., archt.
Barnegat Power & Cold Storage Corp., c/o James W. Mancuso, archt., 206 Horner St., Toms River, N. J., Separate Contracts. **$350,000** SHOPPING CENTER, SOUTH TOMS RIVER, N. J.
Sturm & Co., Inc., 4533 N. Front St., Phila., Pa., Separate Contracts **$380,000,** RESIDENTIAL DEVELOPMENT, Chestnut Ave., TRENTON, N. J.
Gumina Building & Constr. Co., Inc., foot of Talmadge St., New Brunswick, N. J., CA, **$982,262,** general contract 194 apartment addn. to Donnelly HOMES, Calhoun St. between Rossell Ave. and Wiely Ave., TRENTON, N. J. Trenton Housing Auth., 875 New Willow St., Trenton, N. J. Bids Jan. 20, awarded Feb. 24. CD 1/23, under LB.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction
(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

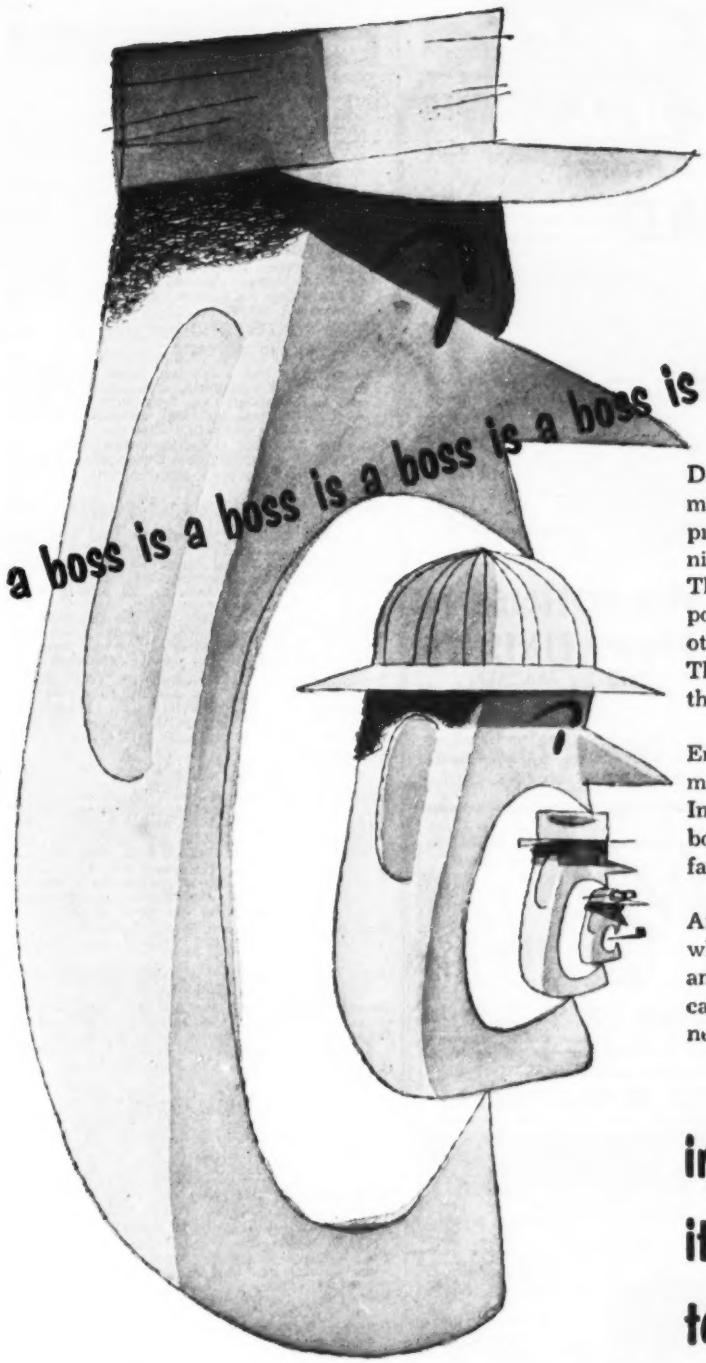
PROPOSED WORK: Including appointment of engineers or architects.
BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.
LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.
Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

▲ **William P. Doall, Inc.,** 504 Penna Ave., Bangor, Pa., CA. **$1,741,300,** Consolidated HIGH SCHOOL, ALLENTOWN, PA. Parkland School Dist., R.D. 3, Allentown, Pa. Bid Jan. 15. CD 1/22, under LB.
South Chester Tube Co., Front and Thrulow Sts., Chester, Pa., Separate Contracts. **$140,000,** 115x400 ft. cinder block, steel WAREHOUSE, CHESTER, PA. Irving S. Towsley, 1428 S. Penn Square, Phila., Pa., archt.
Matthew Leivo & Sons, Inc., New Castle, Pa., CA **$648,000,** general constr., Junior-Senior HIGH SCHOOL for Conneaut Valley Joint School Dist., CONNEAUTVILLE, PA. State Public School Bldg. Auth., 25 and Market Sts., Harrisburg, Pa. Bids Jan. 22. CD 1/28, under LB.
▲ **B. Bornstein & Son,** 2027 Arch St., Phila., Pa., LB **$1,481,000,** Junior Senior HIGH SCHOOL, CORNWELLS HEIGHTS, PA. Bensalem Twp. Auth., Cornwells Heights, Pa. Bids Feb. 8. CD 1/20.
▲ **Sunnybrook, Inc.,** 2826 Mt. Carmel Ave., North Hills, Pa., Separate Contracts. **$1,500,000.** RESIDENTIAL DEVELOPMENT, Oreland Gardens, FORT WASHINGTON, PA. G. Harold Murphy, 1621 Seller St., Phila., Pa., archt.
▲ **George W. Jeffery & Ralph Robinson,** 2601 Parkway, Phila., Pa., Separate Contracts, **$2,250,000.** RESIDENTIAL DEVELOPMENT, LANSDALE, PA. Joseph J. Rauch, 1231 Vine St., Phila., Pa., archt.
▲ **Seal & Turner,** 111 N. Olive St., Media, Pa., Separate Contracts, **$2,400,000,** RESIDENTIAL DEVELOPMENT, Middletown Twp., MIDDLETOWN, PA. George Hay, Lima, Pa., archt.
Branna Constr. Co., 406 Bessemer Bldg., Pittsburgh, Pa., LB **$632,189,** 1 story, 63x343 ft., brick, block steel, Morrow Grade SCHOOL, PENN TWP., PA. School Dist. of Penn Twp., R.D. 1, Verona, Pa. CD 9/29.
Tampa Homes, Inc., 66 and Ogontz Ave., Phila., Pa., Separate Contracts. **$322,000,** RESIDENTIAL DEVELOPMENT, Tampa St., etc., PHILA., PA. J. Ethan Fieldstein, 1325 Walnut St., Phila., Pa., archt.
Croatan Constr. Co., 69 and Walnut Sts., Upper Darby, Pa., Separate Contracts, **$600,000.** RESIDENTIAL DEVELOPMENT, PHILA., PA. Erling Wenge, McClatchy Bldg., Upper Darby, Pa., archt.
Bender Homes, Inc., 1817 S. 4 St., Phila., Pa., Separate Contracts. **$350,000.** RESIDENTIAL DEVELOPMENT, Tyson Ave., PHILA., PA. I. W. Levin, 1531 Belmont Ave., Phila., Pa., archt.
Robert C. Dunn & Co., 111 W. County Line Rd., Bryn Mawr, Pa., CA. **$90,000.** 1 story 70x180 ft. steel frame, STORAGE, PHILA., PA. Athos Realty Co., Chew Ave. and Rosehill St., Phila., Pa.
Joseph J. Kelly, 69 and Walnut Sts., Upper Darby, Pa., Separate Contracts. **$300,000.** RESIDENTIAL DEVELOPMENT, Lloyd St., PHILA., PA.
The Thompson Constr. Corp., 8513 E. Widener Rd., Phila., Pa., LB **$489,764,** Southwest Treatment Works GARAGE and MACHINE SHOP BLDG., and sludge handling, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa., Samuel S. Baxter, water comr., c/o owner. Bids Feb. 18. CD 2/5.
McCloskey & Co., 1620 W. Thompson St., Phila., Pa. LB. **$300,000.** SCHOOL addn., CONVENT and paving, PHILA., PA. St. Timothy's Roman Catholic Church, Hawthorne and Levick Sts., Phila., Pa. Bids Feb. 5. CD 2/5.
Maryland University, College Park, Md. Owner Builds. **$350,000.** LABORATORY, COLLEGE PARK, MD. CD 12/5.
Maryland University, College Park, Md. Owner Builds. **$900,000.** 10 FRATERNITY HOUSES, COLLEGE PARK, MD. CD 1/13.
M. Pollin & Sons, 931 Longfellow St. N.W., Wash., D. C., Owner Builds, **$336,000,** 48 two story brick, cinder DWELLINGS, Chillum Pl. N.E. and Hamilton St. N.E., WASH., D. C. Berla & Abel, 1636 Conn. Ave. N.W., Wash., D. C., archts.
Wm. P. Lipscomb Co., Inc., Woodward Bldg., Wash., D. C., CA, **$374,000.** Meat Processing PLANT, WASH., D. C. Swift & Co., 1 St. and "L" St., Wash., D. C. W. W. Nevin, Union Stock Yards, Chicago, Ill., archts. Awarded Feb. 19. CD 1/23.
Seven-Up Wilmington Co., Claymont, Del., Separate Contracts, **$90,000,** 1 story, 60x200 ft., brick, block WAREHOUSE, CLAYMONT, DEL. J. Ethan Fieldstein, 1325 Walnut St. Phila., Pa., archt.
Cantera Constr. Co., 1508 Penna Ave., Wilmington, Del., CA, **$100,000,** 1 story 20,000 sq. ft., block SPINNING MILL, FREDERICA, DEL. Delaware Mills, Inc. county Airport, New Castle, Del.
Fred G. Krapf, 421 Orange St., Wilmington, Del., CA. **$150,000,** 1 story, 11,000 sq. ft. SHOWROOM and SHOP addn., WILMINGTON, DEL. Frank Diver, Inc., 2101 Penna. Ave., Wilmington, Del.
Ernest Di Sabatino & Sons, Inc., 2601 W. 4 Ave., Wilmington, Del., CA, **$934,278,** Faulk Road SCHOOL, WILMINGTON, DEL. Alfred I. duPont School Dist., 3603 Concord Pike, Wilmington, Del. Bids Feb. 11. CD 2/19, under LB.

(Continued on page 88)



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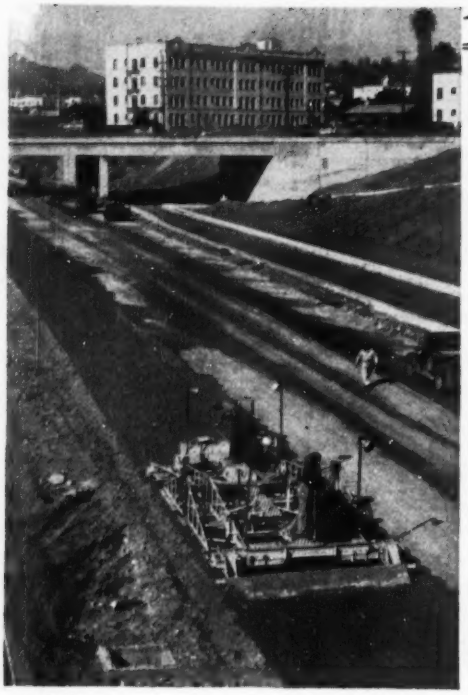

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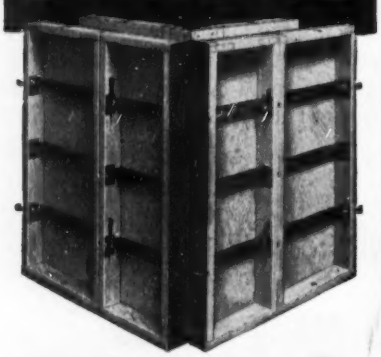

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(Continued from page 86)

SOUTH

BIDS ASKED—BUILDINGS

Ky., Williamstown — SCHOOL — B.A. 3/20 — Bd. Educ., Grant County, Court House, 1 story, 60 x 175 ft., 67 x 161 ft., brick, rein.-con., L-shaped school, Dry Ridge, $300,000. Plans deposit $25. H. Richard Elliston, 18 E. Fourth St., Cincinnati, O., mech engr.-archt. CD 2/10/47.

S. C., Ruffin—HIGH SCHOOL—B. A. 3/25—Colleton Co. Bd. Educ., Walterboro, Negro High School. $350,000. Plans deposit $50. John H. Truluck, Jr., Walterboro, archt.

SOON LETS CONTRACT—BUILDINGS

La., New Orleans—WAREHOUSE—Illinois Central R.R. Co., C. H. Mottier, vice pres. and ch. engr., 135 E. 11 Pl., Chicago 5, Ill., soon lets contract 190 x 816 ft. warehouse, alterations.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Bailey-Brazell Constr. Co., Inc.,** Stokes Bldg., Greenville, S. C., LB $219,105, addnl. aircraft refueling sys., etc., Charleston Air Force Base, Inv. 53-21 CHARLESTON, S. C. U. S. Eng., Customhouse, Charleston, S. C. Bids Feb. 24. CD 1/28.

McDonough Constr. Co. of Georgia, 7 Baltimore Pl., Atlanta, Ga., CA, $587,000 natural gas distr. sys., BOAZ, ALA. City, Boaz, Ala. Bids Feb. 18. CD 2/26, under LB.

MISSISSIPPI—State Hy. Dpt., T. C. Robbins, dir., State Office Bldg., Jackson,

H. H. Metts, Louisville, Miss. CA $96,120. Base preparation, double bit. surf. tr. 11.385 mi. State Hy. 27 between Utica and Crystal Springs, Hinds Co.; CA $74,989, base preparation seal coat, double bit. surf. tr. 15.594 mi. State Hy. 20 between Hazelhurst and Georgetown, Copiah Co.;

Emmett Swilley, 1710 Laurel St., Jackson, Miss. CA $148,925. Grading, drainage, culverts, box bridges 6.33 mi. State Hy. 20 between Pinola and State Hy. 12 jct., Simpson Co. Bids Feb. 24. CD 2/13.

Central Contg. Co., 3000 Crittendon Dr., Louisville, Ky. CA $144,000. Contr. 166, northern ditch trunk, interceptor Sect. A, LOUISVILLE, KY. Metropolitan Sewer Dist., 414 W. Jefferson St., Louisville, Ky. Bids Feb. 20, awarded Feb. 25. CD 4/22/48.

BUILDINGS

LOW BIDS AND CONTRACTS

Certified Builders, 407 Butternut St. N. W., Wash., D. C., CA $507,705, est. $600,000, Tuckahoe Elementary SCHOOL, ARLINGTON, VA. Arlington Co. Bd. Educ., 1426 N. Quincy St., Arlington, Va. Bids Feb. 19, awarded Feb. 26. CD 2/27, under LB.

J. L. Vogel Constr. Co., Cumberland, Md., CA. Approx. $300,000. Constr. 8-room SCHOOL and CHURCH, FALLS CHURCH, VA. St. Anthony's Parish, Falls Church, VA. Awarded Feb. 20. CD 7/14.

Blue Bell, Inc., Jefferson Bldg., Greensboro, N. C. Owner Builds. $100,000. PLANT addn., WOODSTOCK, VA.

Joseph Koury, Burlington, N. C. Owner Builds. $360,000. 40 RESIDENCES, GREENSBORO, N. C.

Concrete Builders, Inc., 800 East Ave. N.E., Atlanta, Ga., LB, $523,932, Sylvan Hills High SCHOOL addn.; **Ralph W. Didschuneit,** Candler Bldg., Atlanta, Ga., LB, $359,729, Ridgewood Elementary SCHOOL, ATLANTA, GA. City Bd. Educ., City Hall, Atlanta, Ga. Bids Feb. 24. CD 1/27.

▲ † **Pressed Steel Car Co., Inc.,** 6 N. Michigan Ave., Chicago, Ill., CA, $2,132,925, 258 unit relocatable HOUSING for Camp Stewart Personnel, CAMP STEWART, GA. Home & Housing Agency, Office of Administrator, 1626 K St. N. W., Wash., D. C.

Dade Liquor Co., 1334 N. Miami Ave., Miami, Fla., Owner Builds, $100,000 WAREHOUSE, MIAMI, FLA.

Daniel Constr. Co. of Alabama, 822 7 Ave. S., Birmingham, Ala., LB, $749,000, POWER PLANT structures, ANDALUSIA, ALA. Alabama Electric Co-operative, Andalusia, Ala. Bids Feb. 24. CD 2/4.

Liles, McElvy & Rutland, 17 Moulton St., Montgomery, Ala. Owner Builds, $400,000. 50 Residences, MONTGOMERY, ALA.

Howie Constr. Co., 720 Bratton St., Jackson, Miss. CA Est. $150,000. PLANT, JACKSON, MISS. W. P. Bridges, Sr., Bridges Bldg., Jackson, Miss. G & O Mfg. Co., lessee.

▲ **J. W. Bateson Co., Inc.,** Irwin-Keasler Bldg., Dallas, Tex. CA $2,398,000. 430 temporary HOUSING units, LAUNDRY bldgs., COMMUNITY bldg., Proj., Ky 2-D-1, CAMP BRECKINRIDGE, KY. Public Housing Admin., 900 N. Lombardy St., Richmond, Va. Bids Feb. 12, awarded Feb. 19. CD 2/17, under LB.

▲ **Struck Constr. Co.,** 147 N. Clay St., Louisville, Ky. CA, est. $2,000,000. 200 HOUSING units, FORT KNOX, KY. Fort Knox Constr. Co., Fort Knox, Ky.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Ill., Rantoul**—BUILDING—B.A. 3/18—U. S. Eng., 475 Merchandise Mart, Chicago, Zone 54, rehabilitation and remodeling Building P-3 (Phase II), Chanute Air Force Base, Serial No. ENG 11-032-53-47. CD 6/28/51.

BIDS ASKED—BUILDINGS

Ill., Chicago—WAREHOUSE—Bids Asked—Marshall Field & Co., State and Randolph Sts., rehabilitation of fur-

niture factory to warehouse, 22 St. and Union Ave. $300,000. Walter A. McDougall, 5 E. Erie St., Zone 11, assoc. archt. James A. Wares, c/o owner, archt. CD 11/1/51.

Ill., North Lake City—FACTORY—Bids Asked—Scholle Chemical Corp., 6643 Ridge Ave., Chicago, 23,000 sq. ft. factory. $250,000. Fridstein Eng. Co., 228 N. La Salle St., Chicago, Zone 1, engr.

SOON LETS CONTRACT — BUILDINGS

▲ Ill., Chicago—OFFICE—Federal Reserve Bank, 230 S. La Salle St., soon lets contract, 2 top floors office bldg. addn. $3,000,000. Naess & Murphy, 80 E. Jackson Blvd., Zone 4, archts. CD 12/19.

▲ Ill., Chicago—FACTORY—Replogle Globes Inc., 325 N. Hoyne Ave., soon lets contract 1 story 75,000 sq. ft. factory. A. Epstein & Sons, 2011 Pershing Rd., Zone 9, archts.

Ill., Chicago—SCHOOL—St. Nicholas Ukrainian Parish, 2238 W. Rice St., soon lets contract elementary school. $500,000. Edo J. Belli, 8 S. Dearborn St., Zone 3, archt. CD 11/11.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

OHIO—State Hy. Dpt., Columbus,

Wander & Mason, Inc., 72 W. Riverglen Dr., Worthington, O., CA. $875,000, est. $769,740. c. conc.-b. conc. paving construct continuous steel beam bridge with concrete deck and substructure (Spans 48 ft., 60 ft., 48 ft., roadway 26 ft., plus 5 ft. sidewalk and 1 ft. 9 in. safety curb) over Ohio Power Co. intake and steel truss bridge with steel beam approach span with concrete and open steel grating deck and with modified existing stone and concrete substructure (Spans four trusses at 154 ft. one swing span at 151 ft., one steel beam approach span at 40 ft., roadway 26 ft., plus one 5 ft. sidewalk) over Muskingum River, 0.278 mi. C. R. 32, Village of Philo and Harrison and Wayne Twps., S-1130 (1), Muskingum Co. Bids Feb. 10. CD 2/16, under LB.

OHIO—State Hy. Dpt., Columbus,

S. E. Johnson Co., P. O. Box 29, Maumee, O., CA. $611,586, est. $676,500, paving with hot mixed, hot laid b. conc. and c. conc. and construct continuous concrete girder bridge with concrete substructure (Spans 53 ft., 70 ft., 53 ft., roadway 52 ft., plus two 5 ft. sidewalks,) Bridge No. 1270 over Swan Creek, 1.922 mi. C. R. No. 68, S-313 (1), Lucas Co.;

rejected bids Feb. 10, paving with hot-mixed, hot laid b. conc. surf. course on c. conc. base and construct steel arch bridge with concrete deck and with reconstructed existing abutments (Span 127 ft., roadway 28 ft., plus 4 ft. sidewalks), Bridge No. 20 over West Branch of Rocky River, 0.307 mi., C. R. 27, Village of Olmstead Falls, S-1101 (1), Cuyahoga Co. LB $273,407.; paving with c. conc. pavement and construct continuous concrete slab bridge with capped-pile pier and concrete caps on existing abutments (Spans two at 27.37 ft., roadway 24 ft. and variable), Bridge No. 99 over Ohio Canal, 0.153 mi. C. R. Nos. 82 and 96, Riverview R. and Canal Rd. in village of Valley View, S-8 (4), Cuyahoga Co., LB $76,430. Bids Feb. 10. CD 2/18, under LB.

† Geis Constr. Co., 332 S. Cassady Ave., Columbus, O. LB $489,662, 160x253 ft., concrete masonry base maintenance shop, incl. grading of site, construct walks, pavement, temporary roadway and utilities, Serial No. ENG-46-022-53-33, Lockbourne Air Force Base, COLUMBUS, O. U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va. Bids Feb. 20. CD 1/22.

Goodwin Constr. Co., Jeffersonville, Ind., LB, $395,000 Section B, sewers, Market, Mulberry, 5, 8, 10 Sts. and Indiana and Ohio Aves.; LB, $483,000 Section E, sewers for nearly annexed territory, JEFFERSONVILLE, IND. Bd. P. Wks., City Hall, Jeffersonville, Ind. Bids Feb. 24.

▲ Illinois—Dpt. P. Wks. & Buildings, Div. Hys., Centennial Bldg., Springfield,

Standard Paving Co., 30 N. La Salle St., Chicago, 2, Ill., LB. $63,408, widening 2 bridges Ill. No. 1, Clark Co.;

C. E. Burgett Constr. Co., R.R. No. 1, W, Mount Rd., Decatur, Ill., LB. $107,686, 1 bridge, F.A.S. 638, Christian Co.;

Strobel Constr. Co., 53 W. Jackson Blvd., Chicago, 4, Ill., LB. $268,712, erecting structural steel and building superstructure for railroad subway on Congress St. Expressway, Cook Co.;

Tri-State Engineering Co., P.O. Box 615, Benton, Ill., LB. $195,809, 2 bridges on Ill. 146, Hardin Co.;

R. W. Ford, 705 S. Market St., Marion, Ill., LB. $148,898, 2 bridges on U.S. 45, Johnson Co.;

H. H. Mass Constr. Co., Algonquin, Ill., LB. $678,822, 1 bridge over Kankakee River, on Schuyler Ave., Kankakee Co.;

McCann & Co., 812 Reisch Bldg., Springfield, Ill., LB. $69,671, 1 bridge, new slab superstructure over another bridge, Ill. 16, Montgomery Co.;

Bauer Bros. Constr. & Supply Co., 429 Lebanon Ave., Belleville, Ill., LB. $79,440, widening 3 bridges Ill. 43, St. Clair Co.;

Eric Bolander Constr. Co., Winchester Rd., Libertyville, Ill., LB. $72,553, 1 bridge, widening another bridge, new culvert, Ill. 16, Shelby Co.;

E. T. Simonds Constr. Co. Inc., 202 W. Willow St., Carbondale, Ill., LB. $109,236, widening 3 bridges, Ill. 3 and 146, Union Co. Bids Feb. 27. CD 2/18.

† U. S. Eng., 402 Locust St., St. Louis, 2, Mo. cancelled bids to have been opened Mar. 10 road surf. on levee Cleark Creek Drainage and Levee District, Project Item VI-E, Union Co., Inv. No. CIVENG 23-065-53-97, ILLINOIS. CD 2/27.

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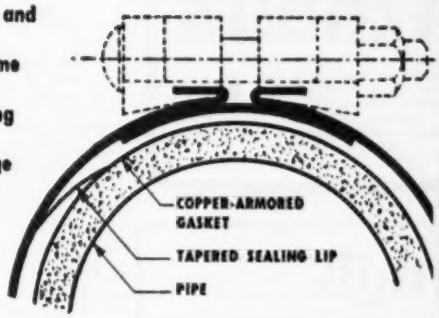

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† **Paul A. Crawley Constr. Co.,** Box 124, Prairie du Rocher, Ill., CA, **$507,655,** levees, Grand Tower Drainage and Levee District, Items II-F and II-G, Jackson Co., CIVENG 23-065-53-92, ILLINOIS. U. S. Eng., 420 Locust St., St. Louis, 2, Mo. Bids Feb. 12. CD 2/20, under LB.

WISCONSIN and MINNESOTA—State Hy. Comn. of Wisconsin and Comr. Hys., State of Minnesota at Office State Hy. Comn., State Office Bldg., Madison, Wis.

Bridge Builders, Inc., 400 W. 78 St., Minneapolis, Minn., LB, **$371,405,** Osceola Interstate Bridge over St. Croix River between Polk County Wis. and Chicago Co. Minn.;

McLain-Astelford Co., 400 W. 78 St., Minneapolis, Minn., LB, **$75,000** on Bridge 6347 approaches. Bids Feb. 24. CD 2/5.

WISCONSIN—State Hy. Comn., State Hy. Office Bldg., Madison,

McLean-Astleford Co., 400 W 78 St., Minneapolis, Minn., LB, **$100,334,** Contract 1, base course, grading 2.479 mi. Rhinelander-Eagle River Road, S.T. Hy. 17, Proj. T 0287 (4), Oneida Co.; LB, **$75,286,** Contract 2, grading, base course 0.221 mi. The West County-Line-Osceola Road, S.T. Hy. 243 T. 0784 (1), Polk Co.,

Megary Bros., St. Cloud, Minn., LB **$274,418,** Contract 1, b. conc. 5.04 mi. The Duck Creek-Suamico Road, U. S. Hys. 41 and 141, Proj. T 02-5 (7) Brown Co.; LB **$134,343,** Contract 1, b. conc. 5.856 mi. The Shawano-Cecil Road, S.T. Hy. 22, Proj. F 039-2 (17), Shawano Co.;

J. P. Humphries, Inc., 1226 W. Wisconsin St., Milwaukee, Wis., LB, **$118,705,** Contract 1, b. conc. 4 mi. New Munster-North County Line and South County Line—Burlington Rd., S.T. Hy 83 Proj. T 0139 (3) and T 0139 (2), Kenosha and Racine Counties,

John F. Bloomer Co., Bloomer Bldg., Appleton, Wis., LB, **$407,822,** Contract 1, b. conc. 9.31 mi. Hilbert-North County Line and South County Line-Askeaton Roads, S.T. Hy. 57, Proj. T 0204 (7) and T 02-4 (8) Calumet and Brown Counties;

Badger Highways Co., Inc., Menasha, Wis., LB, **$159,432,** Contract 1, b. conc. 3.296 mi. Waverly Beach-Appleton and U. S. H. 41-Appleton Roads, Proj. T 019-4 (4) and T 019-4 (5), U. S. Hy. 10, Calumet Winnebago and Outagamie Counties;

H. Turner & Son, Boscobel, Wis., LB, **$236,340** Contract 1, b. conc. 6.4 mi. S.T.H. 57-Cedar Grove Road and Main St. (Village of Cedar Grove) S.T. Hy 32 and 144, Proj. T 0521 (2) and T 069 (2) Sheboygan Co. Bids Feb. 24. CD 2/5.

▲ **Michigan**—Mackinac Bridge Auth., 700 Olds Tower, Lansing,

Merritt-Chapman & Scott Corp., 260 Madison Ave., New York 16, N. Y. CA, **$24,525,600,** substructure;

American Bridge Div., U. S. Steel Corp., 71 Broadway, New York 6, N. Y., CA, **$41,544,563,** steel superstructure, 5 mi. bridge over straits of Mackinac incl. 4 traffic lanes and 3800 ft. main span. CD 1/22/51.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Frank Messer & Sons, Inc.,** 4612 Paddock Rd., Cincinnati, O., LB **$2,661,600.** 336 two story, bsmntless, frame RESIDENCES, Beekman St., CINCINNATI, O. Cincinnati Metropolitan Housing Auth., 505 Armory St., Cincinnati, O. Bids Feb. 26. CD 2/6.

▲ **Zehman-Wolf Constr. Co.,** 13484 Cedar St., Cleveland, O., LB **$3,054,000,** general constr.;

Lorentz Plumbing & Heating Co., 6230 Superior St., Cleveland, O., LB **$749,673,** plumbing, heating, ventilating for 408-unit extens. on Cedar Apartments, Public HOUSING, Central and Scovill Aves. between E. 30 and E. 26 Sts., CLEVELAND, O. Cleveland Metropolitan Housing Auth., 1325 W. 28 St., Cleveland, O. Bids Feb. 25. CD 2/20.

▲† **James Leck Co.,** 211 S. 11 St., Minneapolis, Minn., CA. **$745,000,** construct STEAM PLANT;

Penker Constr. Co., 1030 Summer St., Cincinnati, O., CA. **$1,314,600,** grading foundations, underground installations and work on a PROCESS BLDG. at Atomic Plant, (Subcontractors under Peter Kiewit Sons' Co., P.O. Box 268, Portsmouth, O.) for Atomic Energy Comn., 1901 Constitution Ave., N. W. Wash. 25, D. C. PIKETON and WAKEFIELD, O. CD 8/13/52, under CA.

▲ **Nelson Constr. Co.,** Huntington, W. Va., CA **$1,000,000.** 100-HOME Buena Vista sub-division, SOUTH POINT, O. E. E. Kincaid & R. L. Nelson, Huntington, W. Va.

† **Campbell Constr. Co.,** Warren, O., LB **$473,896.** 1 story, 98 x 400 ft. concrete block maintenance SHOP, incl. macad. hardstand around bldg., relocation of utilities and railroad tracks, Lordstown Ordnance Depot, Serial No. ENG-46-022-53-31, WARREN, O. U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va. Bids Feb. 13 CD 1/20.

John A. Adinolfi, 2236 W. 11 St., Gary, Ind., LB, **$459,100** Calumet Twp. High SCHOOL, 41 Ave. at Hendrick and Whitcomb Aves., GARY, IND. Calumet Twp. School Twp. 15 W. 4 Ave., Gary, Ind. Bids Feb. 19. CD 2/5.

Nels Wagstad Co., 5304 W. Devon St., Chicago, Ill., CA, **$100,000,** FACTORY addn. at Carpentersville Plant CARPENTERSVILLE, ILL. Revcor Mfg. Co., 5201 N. Avondale Ave., Chicago, Ill. Bids Jan. 20. CD 1/15.

Sherman Olson Co., 219 N. Kilpatrick St., Franklin Park, Ill., CA, **$650,000,** FACTORY, Belmont Ave. and Willow St., FRANKLIN PARK, ILL. Cruver Mfg. Co., 2456 Jackson Blvd., Chicago, Ill. Olsen & Urbain, 5 S. Wabash St., Chicago, Zone 3, archts. Awarded Feb. 23.

▲ **Selzer-Ornst Co.,** 6222 W. State St., Milwaukee 13, Wis., CA **$1,300,000,** 2 story, bsmnt., sub-bsmnt., 150 x 225 ft., COMMUNITY CENTER, MILWAUKEE, WIS. Jewish Community Center, 1400 N. Prospect St., Milwaukee 2, Wis. Bids Nov. 12. CD 10/14.

W. W. Oeflein, Inc., 5345 N. Hopkins St., Milwaukee 9, Wis., CA, **$500,000,** STOCK HOUSE addn., alterations, MILWAUKEE, WIS. Miller Brewing Co., 4002 W. State St., Milwaukee 8, Wis. CD 1/6.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Ariz., Chandler**—RUNWAY, etc.—B.A. 3/24—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., primary parallel NW/SE runway and taxiway, Williams Air Force Base, ENG 04-353-53-121, **$750,000.** CD 12/10.

† **Missouri**—B.A. 3/24—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., Agriculture Levee 476-6, Missouri River, near St. Joseph, Andrew Co. CD 2/18.

† **Kan., Topeka**—SQUADRON OPERATION BLDG.—B.A. 3/25—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., squadron operation bldg., complete mechanical and electrical equip., grading, roads, Forbes Air Force Base, ENG 23-028-53-97. CD 5/19/52.

† **Kan., Wichita**—DENTAL CLINIC—B.A. 3/26—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., dental clinic, grading, roads, utilities, etc., Wichita Air Force Base, ENG 23-028-53-98. Wilson & Co., 2860 S. Broadway, engrs. CD 12/22.

† **Kan., Salina**—WAREHOUSE—B.A. 3/27—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., AIO warehouse, utilities, parking areas, service drives, etc., Smoky Hill Air Force Base, ENG 23-028-53-80. Wilson-Shaver-Mann, Salina, engrs. CD 7/2/51.

† **Nebraska**—B.A. 3/31—Bureau Reclamation, Dpt. Interior, Arapahoe, earthwork and structures, Bartley Canal, Station 5 plus 70 Ah to Station 1025 plus 51, laterals, sublaterals and drains, Red Willow Unit, Frenchman-Cambridge Div. Missouri River Basin Proj., south of Republican River between Indianola and Holbrook, Spec. No. DC-3900; adv. ENR 3/12. CD 5/25/44.

BIDS ASKED—BUILDINGS

Mo., Kansas City—FACTORY—B.A. 3/15 to 4/1—Guy's Nut & Potatoe Chip Co., 2313 Campbell St., factory addn. $100,000. Everett L. Peterson, 1103 E. Armour St., Kansas City, Mo., archt.

Colo., Pueblo—SCHOOL—B.A. 3/25—School District 60, Pueblo Co., 1 story grade school $450,000. Edward L. Bunts, 21 E. Monument St., Colorado Springs, engr. and archt. CD 10/23/50.

Tex., Waco—BIBLE BLDG.—B.A. 4/1—Baylor University, Waco, 3 story partial 4th and 5th floors, partial bsmnt., stone, brick exterior Tidwell Bible Bldg. $600,000. Plans deposit $50. Extended date. Easterwood & Easterwood, Bewley Bldg., Fort Worth, archts. R. S. Smith & Assoc., T & P Bldg., Forth Worth, engrs. CD 2/26.

Tex., Galveston—DEPARTMENT STORE—Bids Asked—E. S. Levy Co., 2227 Postoffice St., 3 story, part bsmnt, 60,337 sq. ft., concrete frame and fdn. department store. $750,000. Irving R. Klein & Assoc., 1317 Austin St., Houston, archts. Walter P. Moore and Reg. F. Taylor, Bankers Mortgage Bldg., Houston, engrs. CD 2/10.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

Berghuis Constr. Co., Clara City, Minn. CA **$80,886,** grading, 4.2 mi. between Jct. TH 59 and Currie, Murray Co. Bids Feb. 13. CD 1/28.

American Incinerator Co., 5710 E. Nevada St., Detroit, Mich. LB **$77,000,** incinerator, ST. LOUIS PARK, MINN. Village, J. Justad, clk., St. Louis Park, Minn. Bids Feb. 16. CD 2/10.

IOWA—State Hy. Comn., Ames,

Gee Constr. Co., Shenandoah, Ia., LB, **$134,591,** Div. 1;

The Willman Co., Hy. 150 North, Cedar Rapids, Ia., LB, **$131,897,** Div. 2;

Iowa Road Building Co., Fairmount, Minn., LB, **$68,585,** Div. 4, maintenance bit. resurf. 202.5 mi. MS-16 State Co. Bids Feb. 24. CD 2/2.

Union Constr. Co., 1401 Fairfax Trafficway, Kansas City 15, Kan. LB **$71,502.** Sewer Dist. 655, 77-79 St. and Jarboe to Washington Sts., CD 7/24/52 under LB.;

Torson Constr. Co., 1890 Woodsweather Rd., Kansas City, Mo. LB **$161,202.** Sewer Dist. 651, 81-84 Sts. and Wornall Rd. and Walnut St., KANSAS CITY, MO. City, c/o Reed McKinley, dir. P. Wks. Dpt., Kansas City, Mo. Bids Feb. 20. CD 8/22.

Griffin Constr. Co., 6000 Merriam Dr., Merriam, Kan. CA **$67,705.** 2 sewerage sys., to serve Mission Village, Countryside East, West Hill, Breezy Heights, Sunset Heights View and Walmers addn., northeast Johnson County, OLATHE, KAN. Comrs. Johnson Co., Court House, Olathe, Kan. Myron Nelson, 6915 Johnson Dr., Mission, ch. engr. Awarded Feb. 24.

Bennett Constr. Co., 114 Taylor St., Topeka, Kan. CA **$307,650,** est. $345,000. sewer pumping station, equip., TOPEKA, KAN. City, c/o Edwin R. Jones, clk., Topeka, Kan. Awarded Feb. 3. CD 10/22.

† **U. S. Eng.,** 601 Davidson Bldg., Kansas City 8, Mo. cancelled bids to have been opened Feb. 27. Group B bldgs., Forbes Air Force Base, Eng. 23-028-53-82, TOPEKA, KAN. Will-re-advertise. CD 2/2.

† **Johnson-Canfield Constr. Co., Inc.,** New England Bldg., Topeka, Kan. LB $88,578. airfield lighting, Forbes Air Force Base, Eng. 23-028-53-74, near TOPEKA, KAN.

U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Feb. 20 CD 1/22

† **Star Industries Co,** 610 N. Main St., Wichita, Kan. LB $59,784. fuel storage, Wichita Air Force Base, Eng. 23-028-53-76, WICHITA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Feb. 19. CD 1/28.

Spaw-Glass, Inc., 2518 Times Blvd., Houston, Tex. LB $304,855, est. $75,000, football stadium addn., 2,580 addnl. seats, 10,900 sq. ft. deck seating area, COLLEGE STATION, TEX. Agricultural & Mechanical College of Texas, College Station, Tex. Bids Feb. 24. CD 2/4.

Sherman-Huddleston Constr. Co., Kingsville, Tex. Owner Builds. $71,000, sanitary sewers, GRAND PRIAIRE, TEX. CD 2/24.

Sherman-Huddleston Constr. Co., Kingsville, Tex. Owner Builds. $63,350, site and general earthwork in the village; $60,000, drainage, open type, GRAND PRAIRIE, TEX. CD 2/24.

BUILDINGS

LOW BIDS AND CONTRACTS

Watson Constr. Co., 404 Baker Bldg., Minneapolis, Minn. CA Est. $700,000. 2 story, mezzanine floor, 100,000 sq. ft. WAREHOUSE between 36 and 37 Sts. from Hiawatha Ave. to railroad tracks, MINNEAPOLIS, MINN. L. S. Donaldson Co., K. G. Iverson, pres., 601 Nicollet Ave., Minneapolis, Minn. Bids Jan. 28. CD 1/22.

† **Korshof Constr. Co.,** Blair, Neb., LB $116,507, est. $108,787, Schedule 1, remodeling and initial constr. for Kansas River District HEADQUARTERS bldg., at McCook, Neb., Spec. DC 3869, Missouri River Basin Proj., NEBRASKA. Bureau Reclamation, Dpt. Interior, Indianola, Neb. Bids Feb. 17. CD 1/14.

▲ **Peterson Constr. Co.,** 2263 "Y" St., Lincoln, Neb. Owner Builds. $6,000,000. 350 DWELLINGS, vicinity 59 and A Sts., LINCOLN, NEB.

▲ **T. K. Maenner Co.,** City Natl. Bank Bldg., Omaha, Neb. Owner Builds. $2,000,000. 250 low-priced DWELLINGS, OMAHA, NEB. CD 1/6/50.

Walter Butler Constr. Co., 1300 Minnesota Bldg., St., Paul, Minn. CA Est. $600,000. nurses HOME at hospital, GREAT BEND, KAN. St. Rose Hospital, Great Bend, Kan. CD 12/23.

▲ **Woodcock-Fowler Constr. Co.,** Merriam, Kan. CA Est. $1,210,000. Glenwood Heights subdivision, 110 addnl. RESIDENCES, 80 acres 87 St. and Hemlock Dr., Mission Twp., KANSAS City, KAN. Glenwood Heights R-E Co., Merriam, Kan.

▲ **J. C. Nichols Co.,** 310 Ward Parkway, Kansas City Mo. Owner Builds. $8,500,000. Prairie Fields Subdivision 700 HOUSES 100 acres, 75-79 Sts. and Nall St., extend Tomahawk Rd. and Lamar Ave. into area, Mission Twp., KANSAS CITY, KAN. Edw. Tanner Assoc., 310 Ward Parkway, Kansas City, Mo., archts.

Marvin L. Gassman, 7014 Cornela Lane, Own Forces. Approx. $85,000. 1 story masonry WARHOUSE, DALLAS, TEX.

Relsing Constr. Co., Edinburg, Tex., CA $225,000. PLANT for mfg. concrete pipe, EDINBURG, TEX. Longhorn Concrete Pipe Co., Edinburg, Tex. CD 2/24.

James A. Roberts, 2014 Rosedale St., Houston, Tex., CA $109,600, mfg. PLANT, HOUSTON, TEX. Knight Mfg. Co., 103 Eastway, Houston, Tex. Miles F. Wortham, 2518 Times St., Houston, Tex., engr. CD 11/26, under CA.

Linbeck Constr. Corp., 3616 W. Alabama St., Houston, Tex., CA. $88,185, general mechanicl repair SHOP, HOUSTON, TEX. Linbeck Enterprises, 2720 Saint St., Houston, Tex.

▲ **Gene Brewer,** McClintic Bldg., Midland, Tex. CA, $1,400,000. HOTEL addn., MIDLAND, TEX. Scharbauer Hotel, Wall and Loraine Sts., Midland, Tex. CD 2/26.

City Public Service Bd., 201 N. St. Marys St., San Antonio, Tex., Owner Builds. $91,000, night parking GARAGE, SAN ANTONIO, TEX. Phelps & DeWees & Simmons, 1501-7 Majestic Bldg., San Antonio, Tex., archts. CD 3/7/51, under LB.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

Calif., Los Angeles—B.A. 3/20—Los Angeles Co., Hall of Records, curbs, gutters and walks in Osage Ave., Lawndale, C.T. 1356. $237,982. CD 8/25/49.

▲† **Calif., Muroc**—BARRACKS, etc.—B.A. 3/24—U. S. Eng., 751 S. Figueroa St., Los Angeles, barracks, mess, administration bldg. addns., paving, Edwards Air Force Base, ENG-04-353-53-123. $1,170,000. CD 12/10.

† **Calif., Pleasanton**—MESS—B.A. 3/24—U. S. Eng., 180 N. Montgomery St., San Francisco, officers' mess, Parks Air Force Base. ENG-04-203-53-160. Extended date. CD 2/17.

Calif., Long Beach—B.A. 3/25—City, 205 W. Broadway, subsidence remedial work at Gas Plant No. 1. $90,-000.

▲† **Calif., Muroc**—ROADS, etc.—B.A. 3/30—U. S. Eng., 751 S. Figueroa St., Los Angeles, roads, streets, Eng-04-353-53-122, $1,400,000; technical administration bldg., instrumentation and records lab, Edwards Air Force Base, ENG-04-353-53-126, $750,000. CD 12/10.

† **Calif., Hamilton Air Force Base**—RUNWAY—B.A. 4/1—U. S. Eng., 180 New Montgomery St., San Francisco, widening runway at Hamilton Air Force Base. ENG-04-203-53-166.

BIDS ASKED—BUILDINGS

▲ **Calif., Los Angeles**—HOUSING—B.A. 4/8—Housing Auth. of City of Los Angeles, 1401 E. First St., 73

Briefs from the YEOMANS GUARD

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If you have a nuisance material that's difficult or costly to handle—one of those listed or any other—find out about the Pneu-Pump.

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Do you have—or know of—a Yeomans horizontal centrifugal pump that has lived to a ripe old age and is still working? Enter it in our "Find Mr. Pump" contest and win good money!

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Very likely you've never thought of a pneumatic ejector as a device ideal for handling bulky, heavy, hard-to-handle items too tough for centrifugal pumps or mechanical conveyors.

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• tannery wastes • cannery wastes
• food processing • sugar, bagasse
• powdered coal, ashes
• screenings, sludge . . . and others

It's inexpensive—to install, to operate, to maintain.

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Sarasota Sanitary System Called Outstanding

"We have never seen finer sewage pumping equipment," says a letter from Russel & Axon, Florida engineers for Sarasota's sewerage and treatment works project; "and your engineers have done an outstanding job of equipment installation."

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2 Expelsor* Pneumatic Sewage Ejectors
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The system was designed to meet needs of expected increases in population.

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Here is the popular small lightweight model Crescent scraper bucket used for ordinary excavating. Crescents are built in four other models and fifteen sizes ranging from ⅓ to 15 cu. yd.

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On thousands of earthmoving jobs, Sauerman Scraper machines equipped with the unique Crescent bottomless bucket, are cutting costs in digging, hauling and dumping almost every kind of material.

A "Crescent" penetrates tough materials with ease, gets a full load quickly, hauls this load at average speed of 400 f.p.m.—all with economical use of power. And it dumps automatically at end of haul.

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532 S. CLINTON ST. CHICAGO 7, ILL.

two story and eight one story DWELLINGS, Pacoima low-rent housing. $1,000,000. Extended date.

SOON LETS CONTRACT—BUILDINGS

▲ **Calif., Los Angeles**—HOSPITAL WINGS—Mt. Sinai Hospital, soon lets contract 590 N. Vermont St., two 6 story hospital wings. Welton Becket & Assocs., 5657 Wilshire Blvd., archts. CD 2/5.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Bureau Reclamation,** Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., rejected bids Jan. 6, generators for Palisades power plant, Palisades Proj., Spec. DC 3772, IDAHO. LB. $2,100,000. Will readvertise. CD 1/15, under LB.

† **Fisher Contg. Co.,** Box 4035, Phoenix, Ariz., LB, $782,109 concrete parking apron, appurtenances. Luke Air Force Base, ENG-04-353-100. PHOENIX, ARIZ. U. S. Eng. 751 S. Figueroa St., Los Angeles, Calif. Bids Feb. 25. CD 2/11.

WASHINGTON—State Hy. Comn., Olympia, **G. Blaisdell,** 3026 N. Winchell St., Portland, Ore., **CA, $155,630** b. conc. 0.4 mi. Hy. 1 Ebeyslough to Tulalip Rd., Snohomish Co. Bids Feb. 24. CD 2/10.

▲ **California**—Division of San Francisco Bay Toll Crossings, c/o Dpt. P. Wks., 2054 University Ave., Berkeley, Zone 4.

Peter Kiewit Sons Co., 442 Post St., San Francisco, Calif. and **A. Soda & Co.,** Emeryville, and **Judson, Pacific-Murphy Corp.,** Emeryville, Calif., CA, **$21,099,319,** superstructure;

Peter Kiewit Sons Co. & Ben C. Gerwick, Inc., 112 Market St., San Francisco, Calif., CA, **$14,234,550,** substructure for 4 mi. San Rafael-Richmond Bridge over north arm San Francisco Bay between Richmond and San Rafael, Marin and Contra Costa Counties. Bids Dec. 19. CD 12/23, under LB.

† **George R. Patterson Constr. Co., Inc.,** P.O. Box 2004, Stockton, Calif., CA, **$70,001,** South Fork Road, Sweetwater Creek Section Extension, Folsom Reservoir Project near Folsom, Spec. 1723, CALIFORNIA. U. S. Eng., Wright Bldg., Sacramento, Calif. Bids Dec. 30. CD 12/3.

† **Bureau P. Rds., Dpt. Commerce,** 1101 Flood Bldg., San Francisco, Calif., cancelled bids to have been opened Mar. 3, clearing, grading 4.192 mi. Huntington Lake Sierra National Forest, near S. fork of Tamarack Creek, 10 mi. E. of Shaver Lake, Fresno Co., CALIFORNIA. CD 10/31.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento.

Guy F. Atkinson Co., 10 W. Orange Ave., South San Francisco, Calif., LB, **$1,055,875,** conc. surf. on cement treat., subgrade plant mix surf. on untreated rock base, 7.9 mi. between Tulare Airport and Tagus, Tulare Co. Bids Feb. 18. CD 1/30.

† **U. S. Eng.,** 180 New Montgomery St., San Francisco, Calif., cancelled bids to have been opened Mar. 5, railroad holding yard and engine house, Alameda Medical Depot, ENG 04-203-53-155, ALAMEDA, CALIF. CD 1/30.

† **U. S. Eng.,** 180 New Montgomery St., San Francisco, Calif., cancelled bids to have been opened Mar. 17, pumphouse, sewage pumping station, etc., Castle Air Force Base, Inv. 53-159, CASTLE AIR FORCE BASE, CALIF. CD 1/30.

Sully-Miller Constr. Co., 1500 W. 7 St., Long Beach, Calif., LB, **$131,968,** est. $156,667 Imprv. Orange Ave., San Antonio Dr. to Market St., LONG BEACH CALIF. City, 205 W. Broadway, Long Beach, Calif. Bids Feb. 18. CD 2/3.

† **Edward R. Siple Co.,** 2545 San Fernando Rd., Los Angeles, Calif., LB, **$507,339,** unconventional fuel storage, Edwards Air Force Base, ENG-04-353-53-94, MUROC, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Feb. 20. CD 2/4.

S. & Q. Construction Co., 248 9 St., San Francisco, Calif., LB, **$204,512,** concrete lined open reservoir 19 MG cap., near Lafayette, LS-587, OAKLAND, CALIF. East Bay Municipal Utility Dist., 512 16 St., Oakland, Calif. Bids Feb. 13. CD 1/30.

A. G. Raisch Co., P.O. Box 458, San Rafael, Calif., CA, **$183,209,** street imprvs. in Assessment District on 18 city streets, PETALUMA, CALIF. City, City Hall, Petaluma, Calif. Bids Feb. 16, awarded Feb. 18. CD 1/30.

Wixson & Crowe, P. O. Box 799, Redding, Calif., LB, **$573,959,** grading, bridge 7.88 mi. between Powerhouse and right abutment of Shasta Dam, REDDING, CALIF. Shasta Co., Hall of Records, Redding, Calif. Bids Feb. 24. CD 2/6.

† **E. A. Corniey, Inc.,** 1277 Howard St., San Francisco, Calif., LB, **$102,488,** modification of sawdust collector, Spec. 04-606-53-236, McClellan Air Force Base, SACRAMENTO, CALIF. SAMA, McClellan Air Force Base, McClellan Air Force Base, Calif. CD 6/6.

Stolte, Inc., 8451 San Leandro St., Oakland, Calif., LB, **$378,718,** Sch. 1, steel pipe;

McGuire & Heater, 796 66 Ave., Oakland, Calif., LB, **$387,601,** Sch. 2, rein.-con. pipe, 90 in.I.d. W/short secs. of welded steel pipe, Alameda Creek Siphon No. 2, SAN FRANCISCO, CALIF. Public Utilities Comn., City Hall, San Francisco, Calif. Bids Feb. 17. CD 1/30.

Ets-Hokin & Galvan, 551 Mission St., San Francisco, Calif., LB, **$66,344,** channelization and traffic signals on Market St. from Embarcadero to 10 St., SAN FRANCISCO, CALIF. Dpt. P. Wks., City Hall, San Francisco, Calif. Bids Feb. 18.

BUILDINGS

LOW BIDS AND CONTRACTS

† **Mobilhome Corp. of America,** Inyo and Butte Sts., Bakersfield, Calif., CA **$741,800,** 100 DWELLING

units (relocatable housing) for Naval Ammunition Depot personnel, HAWTHORNE, NEV. Housing & Home Finance Agency, Office of Administrator, 1626 K St. N. W., Wash. 25, D. C.

J. E. Stark, 1131 E. "A" St., Ontario, Calif., LB, $462,390 1 story, frame, stucco Riley SCHOOL addn., AZUSA, CALIF. Azusa City School District, 340 W. 5 St., Azusa, Calif. Bids Feb. 17.

Johnson & Vedder, 3419 Hyde Park Blvd., Los Angeles, Calif., LB $353,421, intermediate SCHOOL, Rowland Ave., COVINA, CALIF. Covina City School District, 410 N. Citrus Ave., Covina, Calif. Bids Feb. 17. CD 2/10.

▲ **George A. Fuller Co.,** 3445 W. 8 St., Los Angeles, Calif., CA, $1,500,000 360x620 ft., steel frame pre-cast tilt-up paper box MANUFACTURING bldg., EAST LOS ANGELES, CALIF. International Paper Co., Container Div. 220 E. 42 St., New York 17, N. Y. D. R. Edwards, 511 Pine Ave., Maywood, Calif. engrs. Awarded Feb. 16, awarded Feb. 24.

Hadley-Cherry, 8754 Beverly Blvd., Los Angeles, Calif., CA, $510,000, 74 frame, stucco DWELLINGS, Akeley Dr., Barnaby Dr., Treaver Ave., GLENDORA, CALIF. Loraine Park Homes, 8754 Beverly Blvd., Los Angeles, Calif. 3/12/53.

▲ **J. C. Boespflug Constr. Co.,** 605 S. Lucas St., Los Angeles, Calif., LB, $1,257,298, 8 rein.-con. Long Beach COLLEGE buildings, LONG BEACH, CALIF. State Div. Architecture, P. Wks. Bldg., 217 West First St., Los Angeles, Calif. Bids Feb. 18. CD 1/13.

Devonshire Assoc., 8687 Wilshire Blvd., Beverly Hills, Calif., Owner Builds, $800,000, 88 frame, stucco DWELLINGS in Chatsworth Area, Woodley and Montgomery Sts., LOS ANGELES, CALIF. Martin Stern, Jr., 450 S. Beverly Dr., Beverly Hills, Calif., archts.

Barrett & Hilp, 918 Harrison St., San Francisco, Calif., CA, $689,320, two EXHIBIT bldgs., California State Fair Grounds, SACRAMENTO, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids Feb. 17. CD 1/30.

Smith-Campbell Co., 6510 Cherry Ave., Long Beach, Calif., CA, $655,000, est. $550,000. Carver SCHOOL, SAN MARINO, CALIF. San Marino Unified School Dist. 1700 Huntington Dr., San Marino, Calif. Bids Feb. 24. CD 2/13.

CANADA

BIDS ASKED—BUILDINGS

Que., Montreal — INSTITUTE — B.A. 3/16—Montreal Sailor's Institute, 352 Pace Royale, 4 story, bsmnt., 75x125 ft., concrete, steel, brick, stone sailor's institute, $500,000. C. R. Tetley, 1235 McGill College Ave., archts. CD 12/9.

BUILDINGS

LOW BIDS AND CONTRACTS

Christensen & Macdonald, Tegler Bldg., Edmonton, Alta., CA, $800,000. 4 story, 71x187 ft., steel, brick AGRICULTURAL BLDG., EDMONTON, ALTA. University of Alberta, Edmonton, Alta. Bids Jan. 20, awarded Feb. 23. CD 1/12.

Cliftside Subdivision Ltd., Scarborough, Ont., Owner Builds, $800,000, concrete, brick APARTMENTS, SCARBOROUGH, ONT.

▲ **Anglin-Norcross Ontario Ltd.,** 57 Bloor St. W., Toronto, Ont., CA, $1,000,000, 5 story, 88x188 ft., L-shaped, 7 story section 44x110 ft., rein.-con., brick, stone PLANT addn., TORONTO, ONT. Colgate-Palmolive-Peet Co. Ltd., 64 Colgate Ave., Toronto, Ont. Bids Feb. 20, awarded Feb. 25. CD 2/13.

▲ **R. & J. Larose Ltd.,** 954 E. Blvd. St. Joseph, Montreal, Que. Owner Builds, $2,000,000, 200 COTTAGES, various sites, MONTREAL, QUE.

ALASKA

BUILDINGS

LOW BIDS AND CONTRACTS

C. R. Foss., Inc., Box 1814, Anchorage, Alaska, LB $564,885, steel, concrete HOSPITAL, PALMER,

Plant Operators are all talking about the Low Maintenance Costs with

DORR CLARIFIERS

And the talk is based on *fact* . . . actual studies of Dorr Clarifiers in operation over a period of years.

For example, look at Cleveland, Ohio's Easterly Treatment Plant — where sixteen 112' dia. Dorr Clarifiers have been in operation since 1932. The figures below are based on actual and accurate plant records — and they're typical of the kind of repair costs you can expect with Dorr units.

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We'd like to tell you how Dorr Clarifiers stack up on performance too. Ask a Dorr Engineer for the facts.

16 Dorr Sifeed* Clarifiers, for handling 123 M. G. D. of activated sludge at Easterly Treatment Plant, Cleveland, Ohio.

*Reg. U. S. Pat. Off.

13-Year Repair Cost Record for 16 DORR Clarifiers

Years of Operation	13
Total Repair Cost	$848.83
Repair Cost *per unit*	$ 53.05
Repair Cost, per unit, *per year*	$ 4.08
% of Original Cost spent for all repairs in 13 years	0.6%

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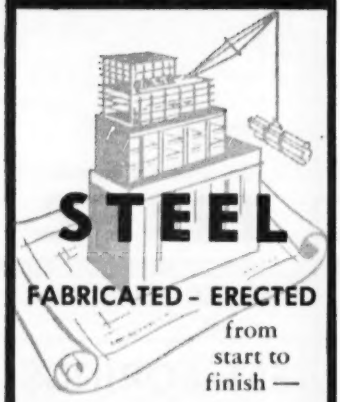

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† Industries Unidas, SA Apartado 1395, Panama, R. de P. CA $117,510, repairing Pier No. 1, U. S. Naval Station, COCO SOLO, CANAL ZONE. Dpt. Navy, Box P, 15th Naval Dist., Navy 121, F. P. O. New York, N. Y.

Proposed Projects

WATER SUPPLY

▲ Mass., Orleans—Town, Water Dpt., Town Hall, water sys. $1,140,000.

▲ Okla., Oklahoma City—City, City Hall, 50 drilled wells and equip. for emergency water supply. $2,000,000. M. B. Cunningham, city engr. CD 7/2.

Tex., Dallas—City, City Hall, Main and Harwood Sts., project abandoned, tapping White Mountain Lake near Fort Worth to obtain augmented city water supply. $750,000. CD 12/18.

SEWERS, WASTE DISPOSAL

Ga., Decatur—Comrs., De Kalb Co. County Office Bldg. 3 garbage incinerators, $600,000

▲ O., Columbus—City, 2 incinerators, one on north side, and other on east side. $2,000,000. CD 1/18/45.

BRIDGES

▲ Tex., Beaumont—Missouri Pacific R.R. Co., W. H. Hobbs, ch. engr. System, Missouri Pacific Bldg., St. Louis 3, Mo., and City of Beaumont. City Hall, overpass, single track elevated structure on Gilbert St. and elevated structure on S.P. ROW, $11,727,000; 2 track elevated structure overpass between Gilbert and College Sts., $10,442,000. DeLeuw, Cather & Co., 150 N. Wacker Dr., Chicago, Ill., engrs. for city.

▲ Tex., Port Arthur—Sabine Lake Causeway Auth., c/o Lamar Lawson, chn., Port Arthur, toll causeway at Sabine Lake. $1,000,000.

STREETS AND ROADS

▲ COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver.

Alamosa Co.—grading, surf., oil S.H. 368 Colo. Secondary Fed. Aid Proj. S 0088(1), Estrella-West. $80,000.

Baca Co.—resurfacing S.H. 100, Colo. Secondary Fed. Aid Proj. S 0002 (10), Springfield-Walsh. $100,000.

Bent Co.—grading, surfacing, oil S.H. 101 Colo. Secondary Fed. Aid Proj. S 0088 (1), West of Estrella, $60,000.

Cheyenne Co.—grading, surfacing, S.H. 51 Colo. Secondary Fed. Aid Proj. S0001 (15), North of Cheyenne Wells, $100,000.

Conejos Co.—grading, surfacing, oil S.H. 368 Colo. Secondary Fed. Air Proj. S 0088 (1), West of Estrella, $88,000.

Crowley Co.—stabilization, oil, S.H. 71, Colo. Sec. Fed. Aid Proj. S0026 (6), Ordway-North, $80,000.

Custer Co.—oil surfacing S.H. 96, Pueblo-Custer Colling West, S.0016 (7), $90,000.

Douglas Co.—stabilization, surf., oil S.H. 86 Castle Rock, Franktown, Colo. Secondary Fed. Aid Proj. S 0040 (3), $75,000.

Elbert Co.—grading, surfacing oil. S.H. 86 Kiowa-East, Colo. Sec. Fed. Aid Proj. S 0028 (4), $163,000.

Fremont Co.—grading surfacing oil S.H. 67 Florence-South, Colo. Secondary Fed. Aid Proj. S 0081 (2), $125,000.

Garfield Co.—grading, structures, paving S.H. No. 4, Rifle-Grand Valley, Colo. Primary Fed. Aid Proj. F 001-1 (9), $750,000.

Grand Co.—grading, surf. S.H. 84, Gore Pass, Colo. Secondary Fed. Aid Proj. S 0134 (3), $250,000.

Gunnison Co.—stabilization, oil S.H. 114, Parlan-South, Colo. Secondary Fed. Aid Proj. S0124 (5), $135,000.

Jackson Co.—grading, surfacing, oil S.H. 125 Jct. S.H. 125 and 127 North, Colo. Secondary Fed. Aid Proj. S0103 (2), $110,000.

Jefferson Co.—grading, structures, paving, S.H. 8, Morrison, Colo. Primary Fed. Aid Proj. F 016-1 (4), $240,000.

Kit Carson Co.—grading, surfacing oil S.H. 51, south of Burlington, Colo. Secondary Fed. Aid Proj. S 0001 (16), $136,300.

Lake Co.—grading, surfacing, soil S.H. 300, Malta-Fish Hatchery, Colo. Secondary Fed. Aid Proj. S 0132 (1), $70,000.

Larimer Co.—grading, surfacing and oil S.H. 92, Hotchkiss-Crawford, Colo. Secondary Fed. Aid Proj. S 0125 (4), $300,000.

grading, surfacing oil S.H. 56, Berthoud-West, Colo. Secondary Fed. Aid Proj. S 0076 (1), $60,000.

grading, surfacing, oil S.H. 200, The Forks-Livermore, Colo. Secondary Fed. Aid Proj. S 0106 (1), $140,000.

Lincoln Co.—grading, surfacing, oil S.H. 71, Limon-North, Colo. Secondary Fed. Aid Proj. S 0019 (2), $227,000.

grading, structures, paving S.H. No. 8, Limon, Colo. Primary Fed. Aid Proj. F 017-3 (2), $350,000.

Montrose Co.—grading, surfacing, oil S.H. 347, Bostwick Park, Colo. Secondary Fed. Aid Proj. S0127 (1), $100,000.

Morgan Co.—stabilization, oil S.H. 71, south of Brush, Colo. Secondary Fed. Aid Proj. S0021 (2), $103,000.

Otero Co.—grading, surfacing, o-l Rocky Ford-Cheraw, Colo. Secondary Fed. Aid Proj. S 0172 (1), $150,000.

Prowers Co.—grading, surfacing oil S.H. 192, Lamar-West, Colo. Secondary Fed. Aid Proj. S 0042 (1), $108,000.

Rio Grande Co.—grading, surfacing, oil S.H. 374, Jct. S.H. 15, to Sargents School, Colo. Secondary Fed. Aid Proj. S 0044 (1), $150,000.

Routt Co.—grading, structures, paving S.H. No. 2, Mt. Harris-Hayden, Colo. Primary Fed. Aid Proj. F 005-2 (10), $320,000.

grading, surfacing, oiling S.H. 84, Toponas-Gore Pass, Colo. Secondary Fed. Aid Proj. S 0134 (4), $190,000.

Saguache Co.—grading, surfacing, oil S.H. No. 114, Saguache-N.W., Colo. Secondary Fed. Aid Proj. S 0124 (6), $115,300.

San Miguel Co.—grading, surfacing, oil. S.H. 145, Placerville-Telluride, Colo. Secondary Fed. Aid Proj. S0150 (4), $120,000.

Washington Co.—grading, surfacing, oil S.H. 71, Wash.-Morgan Co. Line South, Colo. Secondary Fed. Aid Proj. S 0021 (2), $150,000.

Weld Co.—grading, surf., oiling S.H. 14, Briggsdale-New Raymer, Colo. Secondary Fed. Aid Proj. S 0024 (8), $225,000.

grading, structures, road mix. S.H. 254, Longmont, Colo. Secondary Fed. Aid Proj. S 0072 (1), $170,000. Mark U. Watrous, state hy. engr.

▲ **O., Cincinnati**—City, City Hall, exten. Erkenbrecher Ave. from Vine St. to Jefferson Ave. installation of viaduct over Reuther Ave. $1,095,000-$1,160,000; relocation of Red Bank Rd. from Madison Rd. to Erie Ave. eliminate hill and replace with divided hy. $75,700. T. J. Montgomery, city engr. CD 11/7.

Tenn., Knoxville—City, City Hall, sidewalks, curb and gutter at schools lacking such facilities. $600,000. CD 10/8/51.

EARTHWORK, WATERWAYS

▲ **Calif., Marysville**—Yuba County Water Resources Bd., Marysville, water development sys., incl. 2 power plants. $33,000,000. E. A. Bailey, Falling Acorns Banner Bldg., Nevada City, consult. engr.

LATIN AMERICA

▲ **Mexico, El Recodo**—Sira. de Recursos Hidraulicos, p. de la Reforma, 69, Mexico City, plans irrigation dam, $2,000,000.

Mexico, Mazatlan—Sira. de Recursos Hidraulicos, P. de la Reforma, 69, Mexico City, plans aqueduct. $500,000 Manuel Anaya, c/o owner, engr.

▲ **Mexico, Tuxtla Gutierrez**—State Govt., Palacio del Estado, Tuxtla Gutierrez, plans WW, sewerage, $2,310,000.

Peru, Ilo—American Smelting & Refining Co., 19 Nassau St., New York 5, N. Y., U.S.A., plans dock and shore installation for copper mining, Toquepala Proj. Frederick Snare Corp., 233 Broadway, New York 7, N. Y., U.S.A., engrs. CD 2/11.

PUBLIC BUILDINGS

▲ **Calif., Los Angeles**—SCHOOL—Los Angeles Bd. Educ., 1425 S. San Pedro St., plans by H. L. Gogerty, 3123 W. 8 St., Gardena High School, 182 St. and Normandie Ave., Gardena, $3,500,000. CD 6/13.

Calif., Pacific Grove—SCHOOLS—City, City Hall, voted $772,000 bonds, schools. CD 12/30.

▲ **Calif., Richmond**—OFFICE—Contra Costa Co., Hall of Records, Martinez, $1,350,000, bond election May 12, county office bldg. CD 11/9/51.

▲ **Calif., San Francisco**—PUBLIC GARAGES—Parking Authority City of San Francisco, 500 Golden Gate Ave., public garages, one at Ellis and O'Farrell Sts. between Powell and Stockton Sts., other at Fifth and Mission Sts. $500,000 each.

▲ **Colo., Greeley**—SCHOOL—Bd. Educ., Greeley, bond election Apr. 14, new Junior High School, Greeley High School addn., and elementary school, $1,600,000. CD 6/26/51.

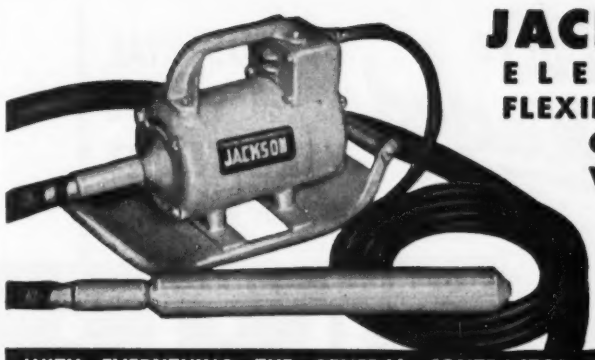
Conn., Ridgefield—SCHOOL—Town Bd. Selectmen, Town Hall, plans by Sherwood Mills & Smith, 65 Broad St., Stamford, elementary school, Lounsbury Property. $691,600. CD 1/30/50.

Fla., Ft. Lauderdale—HOSPITAL—Broward General Hospital, 1612 S. E. 1 Ave., plans by Gamble, Pownall & Gilroy, 1407 E. Las Olas Blvd., hospital addn. $900,000.

▲ **Fla., Jacksonville**—COURT HOUSE—Duval Co. Court House, plans by Reynolds, Smith & Hills, 227 Park St., court house. $2,000,000. CD 1/27.

▲ **Ill., Chicago**—HOUSING—Chicago Housing Auth., 608 S. Dearborn St., Zone 5, plans by Skidmore, Owings & Merrill, 100 W. Monroe St., Zone 3, five apartments "Henry Horner Homes", incl. 325 units, Ashland Ave. and Washington St. $3,500,000. CD 2/2/50.

▲ **Ill., Chicago**—GARAGES—City, City Hall, plans by Shaw, Metz & Dolio, 208 S. La Salle St., Zone 4, garage, State St. near Wabash St., plans by Naess & Murphy, 80 E. Jackson Blvd., Chicago, Zone 4, garage, Madison, Monroe and Wacker Dr.; plans by Everett Quinn & Assocs., 134 N. La Salle St., Zone 2, garage, Congress and Harrison St.; plans by Schmidt, Garden & Erikson, 104 S. Michigan Ave., Zone 3,



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garage, Wabash, Grand, Russ, Illinois Sts.; plans by Loebl, Schlossman & Bennett, 430 N. Michigan Ave., garage, Rush, Delaware and Chestnuts Sts.; plans by Holabird Root & Burgee, 180 N. Wabash St., Zone 1, garage, Huron, St. Clair, Superior and Fairbank Court; plans by Friedman, Alschler & Sincere, 223 Jackson Blvd., Zone 6, garage, La Salle St. across from City Hall; plans by Graham, Anderson, Probst & White, 80 E. Jackson Blvd., Zone 4, garage, La Salle St. and Chicago River; plans by Jensen McClurg & Halstead, 39 S. La Salle St., Zone 3, garage, Grand, St Clair, Ohio and Fairbank Court. Total cost $20,000,000. CD 9/2/52, under Industrial Buildings and 2/21/50 under Public Buildings.

▲ **Ill., Dundee**—SCHOOLS—School District 300, Dundee, plans by Bradley & Bradley, 226 S. Main St., Rockford, grade school and school addns., $1,200,000.

Ky., Louisville—SCHOOL—Jefferson Co. Bd. Educ., W. Jefferson St., plans by Fred Hartstein and Louis & Henry, McDowell Bldg., 2 story, masonry county school, Medora. $500,000, E. R. Ronald & Assoc., 554 S. Third St., consult. engrs. CD 11/10/52.

▲ **Md., Bel Air**—SCHOOL—Harford Co. Bd. Educ., Gordon St., plans by Palmer, Fisher, Williams & Nes, 1020 St. Paul St., Baltimore, 1 story, brick Edgewood High School gymnasium, library, cafeteria, Edgewood, $1,300,000.

▲ **Mass., Halifax**—SCHOOL—Towns Halifax, Kingston, Pembroke and Plymouth, Regional School Comn., John Farmer, chn., W. Elm St., Pembroke, plans by Walter M. Gaffney, 43 Potter St., Hyannis, Silver Lake Regional High School. $1,500,000. CD 12/19.

▲ **Mich., Algonac**—SCHOOL—Bd. Educ. Algonac School Dist., voted $1,200,000 bonds, 2 elementary schools one at Fair Haven and other at Pointe Tremble and Junior High School, Maul & Lentz, 1222 Michigan Bldg., Detroit, archts. CD 1/15.

Mich., Jackson—HOSPITAL—Bd. Supervs. Jackson Co., Court House, referendum vote special 4 million tax levy Apr. 6, brick, concrete hospital, $750,000.

Mich., Saginaw—HOSPITAL—Bd. Supervs. Saginaw Co., Court House, $675,000 bond election Apr. 6, infirmary unit county hospital.

▲ **Miss., Jackson**—SCHOOLS—City, City Hall, plans by Jones & Haas, Standard Life Bldg., Woodrow Wilson High School, $1,000,000; plans by Biggs, Weir & Chandler, 224 N. Congress St., Robinson Road High School, $1,000,000. CD 9/3/52.

▲ **Mo., Hazelwood (Florrisant P. O.)**—SCHOOL—Hazelwood School Dist. R-1, St. Louis Co., Bd. Educ., Mrs. Lorena Lusher, supt. Schools, Elm Grove School, Rte. 3, Florissant, voted $1,000,000 bonds Feb. 21, high school, Larlmore School addn. Raymond X. Gruenlnger, 4 S. Central Ave., Clayton, Zone 5, archt.

▲ **Mo., North Kansas City**—SCHOOLS—Bd. Educ., Clay Co., Liberty, voted $1,250,000 bonds Feb. 10, 3 schools, 2 school addns. CD 12/23.

▲ **Mo., Overland (St. Louis 14 P. O.)**—SCHOOL—Ritenour Consolidated School Dist., Arthur A. Hoech, supt., 9120 Bristol Ave., Zone 14, voted $1,800,000 bonds, Feb. 17, junior high school, Ashby Rd. and Breckenridge Ave., 3 elementary school addns.

▲ **Mo., Raytown**—SCHOOL—City, voted $1,000,000 bonds Feb. 15, elementary school, high school addn. Marshall & Brown, 1016 Baltimore St., Kansas City, Mo., archts. CD 1/13.

N. J., Egg Harbor—SCHOOL—Egg Harbor Twp. Bd. Educ., Egg Harbor, elementary school, $500,000. CD 8/29/46.

▲ **N. J., New Brunswick**—LAW CENTER—Rutgers University, New Brunswick, law center bldg. near present law school bldg., 37 Washington St. $1,500,000. CD 3/8/51.

▲ **O., Cincinnati**—SCHOOLS—Bd. Educ., 216 E. 9 St., plans by Potter-Tyler-Martin & Roth, 128 E. 6 St., Madisonville Junior High School addn., Madison Rd. and Anderson Pl., $1,785,000; plans by Schatz, Ellis-ton, Hall, McAllister & Stockwell, 18 E. 4 St., Cumminsville Junior High School addn., Beechhill and Langland Aves., $1,800,000. CD 4/3.

O., Cincinnati—POLICE STATION—City, City Hall, police station, Lincoln Park Dr., combining Districts 1 and 4. $650,000. T. J. Montgomery, city engr.

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▲ **Pa., Elkins Park**—SCHOOL—Cheltenham School Dist., Montgomery Ave., plans by Heacock & Platt, 152 N. 15 St., Phila., Junior High School, $2,000,000.

R. I., South Kingston—GYMNASIUM—Town, James Norman, chn. School Bd. Comn., South Kingston, plans by J. William Beal Sons, 185 Devonshire St., Boston, Mass., gymnasium addn. to high school bldg. now under constr. Hazard Property. $500,000.

S. C., Anderson—HIGH SCHOOL—Anderson Co. Bd. Educ., Anderson West Side High School for Negroes. $500,000.

▲ **Tenn., Memphis**—ADMINISTRATION, etc.—University of Tennessee, Knoxville, plans by Furbringer & Ehrman, Union Planters Bank Bldg., admin. bldg. $950,000; plans by Norton & Rice, Falls Bldg., medical-surgical bldg., $1,065,000, foregoing at University of Tennessee Medical School. CD 2/20.

▲ **Tex., Austin**—SCHOOL FOR DEAF—Board for Texas State Hospitals & Special Schools, Design and Constr. Div., 4405 Lamar Blvd., plans by Walter Moore, 4405 Lamar Blvd., State School for Deaf. construct large number of cottages for 485 children patients. $2,384,-492. CD 12/9/48.

Tex., Dallas—WOMENS EXHIBIT—State Fair of Texas, c/o Fair Park, 50,000 sq. ft. women's exhibit bldg. $600,000.

▲ **Tex., Hereford**—SCHOOL—Hereford Independent School Dist., Hereford, plans by B. R. Cantrell & Co., Box 1638, Pampa, school, $350,000; high school, $750,000. Landauer, Guerrero & Shafer, 4801 Lemmon St., Dallas, consult. engrs. CD 1/29.

▲ **Tex., San Antonio**—COURT HOUSE, etc.—Bexar Co., Court House, bond election Mar. 31, courts and jail bldg. $3,925,000. CD 2/4.

Tex., San Marcos—SCHOOL—San Marcos Independent School Dist., San Marcos, voted $300,000 bonds Feb. 21, elementary school, $503,280. Harvey P. Smith & Assoc., 1204 Natl. Bank Commerce Bldg., San Antonio, archts. CD 2/11.

▲ **Wash., Seattle**—JOURNALISM—University of Washington, Zone 5, plans by Heath, Gove & Bell, Tacoma Bldg., Tacoma, Zone 2, 3 story, 115x282 ft., rein.-con. journalism bldg. addn. $1,000,000. CD 2/14/49.

Wash., Vancouver—JUNIOR HIGH SCHOOL—Vancouver School Dist., City Hall, plans by Lee Thomas, Regal Bldg., Portland, Ore., Lewis Elementary School addn. to convert it into Junior High School $510,000.

W. Va., South Charleston—LABORATORY—State, Capitol Bldg., Charleston, health laboratory. $500,000.

▲ **Alaska, Fairbanks**—HIGH SCHOOL—Alaska P. Wks., Dpt. Interior, Juneau, plans by Alaska Architectural & Engine Engineering Co., Box 509, Fairbanks, high school, Proj. 50-A-5. $2,385,000. CD 2/20.

▲ **B. C., Nelson**—HIGH SCHOOL—Nelson School Dist. No. 7, A.K. Gibbons, secy., Nelson high school, $1,000,000; Salmo High School addn. Salmo, $400,-000.

COMMERCIAL BUILDINGS

▲ **Ala., Tuscaloosa**—HOTEL—J. A. Duckworth, Tuscaloosa, hotel, $1,500,000.

▲ **Ark., Little Rock**—OFFICE—Arkansas Power & Light Co., 4 and Louisiana Sts., plans by Wittenberg, Delony & Davidson, Pyramid Bldg., office, $1,000,000. CD 2/17.

▲ **Conn., Hartford**—OFFICE—Connecticut General Life Insurance Co., 55 Elm St., plans by Skidmore, Owings & Merrill, 575 Madison Ave., New York, 22, N. Y., home office, Washington and Buckingham Sts. $2,000,-000. CD 12/27/51.

Ind., Columbus—BANK—Irwin Union Trust Co., S. E. Lauther, exec. vice pres., Columbus, plans by Eero Sparinen, West Lake Rd., Bloomfield Hills, Mich., 1 and 2 story irregular, stone, brick bank, 5 and Washington Sts., $500,000.

▲ **Ind., Greencastle**—LIBRARY—Depauw University, H. C. Shepherd, pres. Bd. Trustees, Greencastle, library. $1,000,000.

Ia., Centerville—HOSPITAL—Sisters of Mercy of Union, c/o John Young, chn., 1801 S. 72 St., Omaha, Neb., St. Joseph's Mercy Hospital addn. $600,000.

Ia., Sioux City—Y.M.C.A. BLDG.—Young Men's Christian Assn., 701 Pierce St., plans by Wm Beuttler, 405 Insurance Exchange Bldg., Sioux City, Y.M.C.A. Bldg. $750,000.

Ky., Frankfort—HOSPITAL—King's Daughters' Hospital, 214 W. Third St., hospital wing addn. $750,000.

Ky., Newport—SCHOOL—Diocese of Covington, Madison Ave., Newport Catholic High School adjoining St. Martin Home overlooking 12 and Monmouth Sts., $750,000.

Md., Baltimore—HOUSES—Leonard E. Kalus, 5713 Ranny Rd., thirty-four 1 story, bsmnt., 28x43 ft., masonry houses, Rogers and Kennison Aves., $510,000.

▲ **Md., Baltimore**—APARTMENTS—H.A. Knott, 2406 Greenmount Ave., plans by Jas. Cox, 601 St. Francis Rd., Towson, Coppin Manor Apartments, incl. 18 brick buildings, 203 units, Gwynns Falls Parkway, $1,250,000.

▲ **Md., Baltimore**—RESIDENCES—A. J. Watkins & Sons, Inc., 202 E. 25 St., Baltimore, 100 residences on 1 acre plots, 208 acre tract, roads, utilities, Dulaney Valley Section, $3,000,000, Albert E. Pohmer, 833 Park Ave., Baltimore, civil engr.

▲ **Md., Frederick**—HOUSES—Hamilton Homes, Inc., 6 E. 2 St., plans by Ross, Walton & Madden, 3510 Rhode Island Ave., Mount Ranier, three hundred 1 story, frame houses, Eastern section of here, $3,000,000.

▲ **Mich., Escanaba**—SCHOOL—Catholic Diocese of Marquette, Rev. O'Neil D'Armour, exec. secy. Bd. Educ., Catholic Central High School, $1,100,000.

▲ **Mo., Clayton** (St. Louis 5 P.O.)—OFFICE—Sidney M. Studt, 5 Forsyth Walk, Zone 5, 3 and 5 story office, underground facilities, automobile storage, Brentwood Blvd. and Carondelet Ave. $1,000,000.

▲ **Mont., Billings**—BANK, etc.—First Bank Stock Corp., First National Soo Line Bldg., Minneapolis, Minn., plans by Orr Pickering & Assoc., Fratt Bldg., 10 story, bsmnt., 100x140 ft., rein.-con. bank and office, $2,000,000. Owner has purchased site and lease contracts of John A. Stephenson & Co., 8 N. Second Ave., Duluth, Minn., which had planned similar building. CD 11/19, under CA.

▲ **Neb., Elkhorn** — MONASTERY, etc. — Benedictine Order, c/o Rev. G. T. Bergan, 6300 Dodge St., Omaha, plans by Steele, Sandham & Steele, Electric Bldg., Omaha, monastery and seminary, $1,000,000. CD 1/22.

N. Y., Jackson Heights—APARTMENT—Brulene Co-operative Apartments, c/o Samuel Paul, archt., 163-18 Jamaica Ave., Jamaica, 97 family, 6 story apartment, 94 St. and 34 Ave. $500,000.

N. Y., New York—HOTEL—Hotel New Yorker, 8th Ave. and 34 St., Zone 1, lobby, main entrance, mezzanine, ballrooms alterations and other work at premises. $600,000

▲ **N. Y., New York**—SCHOOL, etc.—St. Lucy's Church, 2511 Bronxwood Ave., Zone 67, plans by Anthony J. DePace, 151 W. 46 St., Zone 19, 2 story school, Bronxwood and Mace Aves. $850,000; 2 story rectory, Mace Ave. near Matthews Ave. $150,000.

▲ **O., Delaware**—HOUSES, etc.—Ohio Wesleyan University, Delaware, 15 faculty houses, 2 fraternity houses, and men's dormitory, $1,000,000.

▲ **Okla., Tulsa**—MEDICAL CENTER—Don Nix, Mayo Bldg., plans by McCune & McCune, Utica Square, 60,000 sq. ft. Utica Square Medical Center, $1,-000,000.

▲ **Pa., Chester**—HOSPITAL—Sacred Heart Hospital, 9th and Wilson Sts., plans by George E. Yundt, 16 S. 16 St., Allentown, hospital. $1,000,000.

▲ **Tenn., Jackson**—COLLEGE—Lambuth College, Jackson, plans by Poundstone, Ayres & Godwin, Bona Allen Bldg., Atlanta, Ga., college group. $1,000,000.

▲ **Tex., Houston**—SHOPPING CENTERS—Theodore W. Berenson, Wm. Lane & Fred Pondren and Ben G. McGuire, Bankers Mortgage Bldg., plans by John Graham & Co., engrs.-archts., Dexter Horton Bldg., Seattle, Wash., Sect. 1, 15-store space shopping center unit, $2,000,000; Sect. 2, 10 store space incl. department store unit, $3,500,000; Sect. 3, 25-store space, $2,240,000; Sect. 4, 30-store space, $2,500,000. Irving R. Klein & Assoc., 1317 Austin St., assoc. archts. CD 2/11.

Tex., Houston—SHOPPING CENTER—Mactel Development Corp., 1820 Calhoun St., plans by Charles McKim, 1615 Blodgett St., 2 story, 90,000 sq. ft. steel Allendale shopping center, $750,000.

▲ **Tex., Houston**—OFFICE—Troy V. Post M. & W. Tower Bldg., Dallas, plans by Wyatt C. Hedrick, consult. engr.-archt., 5201 Fannin St., 22 story annex to existing "Shell" 23-story office. $1,500,000.

▲ **Va., Lynchburg**—DORMITORY, etc.—Lynchburg College Bd. Trustees, Lynchburg College, Lynchburg, plans by Stanhope S. Johnson, Lynchburg, girls' dormitory and library. $1,000,000. CD 1/28/52.

Va., Norfolk—HOUSES—Harlee Constr. Co., 417 Kresge Bldg., 65 one story brick veneer houses, near London Bridge. $500,000. Leon Cashvan, c/o owner, engr.

▲ **Va., Norfolk**—RESIDENTIAL—Little Creek Realty Corp., c/o S. L. Nusbaum & Co., 148 Granby St., 650 unit residential proj. $6,000,000.

▲ **Wash., Seattle**—APARTMENT—G. D. Runnels, 120 W. Highland Dr., and T. Robinson, 3416 14 Ave. S., plans by Grainger, Thomas & Baar, Arcade Bldg., Zone 1, 8 story, bsmnt., rein.-con. apartment to be known as Sylkane House, $1,000,000.

▲ **Wis., Greenfield** (P.O. West Allis)—SHOPPING CENTER—West Allis Shopping Center, nlc., 4809 W. 27 St., Minneapolis, Minn., 75 to 80 store shopping center, 6,000 car parking area. $14,000,000-$15,-000,000.

▲ **Ont., Toronto**—HEADQUARTERS—Canadian National Institute for the Blind, 186 Beverly St., plans by Stanford & Wilson, 86 Charles St. E., headquarters bldg. $1,000,000. CD 2/26.

▲ **Ont., Toronto**—HOTEL—Owner, c/o Page & Steele, archts., 72 St. Clair Ave. W., 10 story, 200-room Torontonian Hotel, drive-in entrance, shopping center, Yonge, Wood and Alexander Sts. $2,500,000.

INDUSTRIAL BUILDINGS

▲ **Calif., Milpitas**—ASSEMBLY PLANT—Ford Motor Co., 3000 Schaefer St., Dearborn, Mich., assembly plant on 160-acres 1 mi. south of here and 4 mi. north of San Jose, $35,000,000-$50,000,000.

Ind., Bloomington — INDUSTRIAL — Tarzian Industries, Bloomington, industrial bldg. $500,000.

▲ **Mo., Kansas City**—PLANT—Ford Motor Co., 3000 Schaefer Rd., Dearborn, Mich., plant expansion, near here. $500,000,000.

Mo., Kansas City—MANUFACTURING—Wilson Athletic Goods Mfg. Co., c/o Wilson Miller, plant mgr., 1511 Baltimore St., 48,700 sq. ft. mfg. bldg. on 126,000 sq. ft. site, at 10th Terrace and Kensington Ave. $500,000.

Neb., Omaha — WAREHOUSE — American Community Stores Corp., 711 S. 11 St., warehouse for Hinky-Dinky System, $750,000.

▲ **N. Y., Yonkers**—FACTORY—Habirshaw Cable & Wire Co., 40 Wall St., New York, Zone 5, factory on 9-acre tract on Old Nepperhan Rd. between Putnam R.R. and Sawmill River Rd. $5,000,000.

▲ **O., Cambridge**—PLANT—Champion Spark Plug Co., 627 Fisher Bldg., Detroit, Mich., ceramic plant, $2,000,000.

Okla., Eola — PLANT — Schio Oil Co., Skirvin Tower, Oklahoma City, natural gas line absorption plant. $500,000. L. W. Willebrand, c/o owner, engr.

▲ **Ore., Portland**—GRAIN ELEVATOR—Portland Public Docks Comn., 3070 N. W. Front St., grain elevator. $2,500,000. Jones-Hettelsater Co., 1911 Baltimore St., Kansas City, Mo., consult. engr.

▲ **Tex., Houston**—PLANT—General Bronze Corp., Stewart Ave., Garden City, N. Y., aluminum products plant $1,000,000.

▲ **Tex., San Antonio**—DIESEL SHOP, etc.—Southern Pacific Lines, L. A. Loggins, ch engr., Southern Pacific Bldg., Houston, Zone 1, addnl. diesel shop expansion for repairs and maintenance, $250,000; enlargement of switching yards, $650,000; some roundhouse improvs. $100,000.

Alta., Edmonton—WAREHOUSES—General Motors Products of Canada Ltd., Oshawa, parts warehouse, 99 St. between 63 and 65 Aves. $700,000.

▲ **Man., Winnipeg**—PLANT—Griffin Wheel Co. Ltd., St. Hyacinthe, Que., 1 story, 70,000 sq. ft., wheel mfg. plant, at North Transcona, $3,000,000. CD 12/2.

▲ **Ontario**—MINE DEVELOPMENT—Caland Ore Co., Ltd. subsidiary Inland Steel Co., 38 S. Dearborn St., Chicago 3, Ill., U.S.A., plans 7 year development of iron mines incl. 3-4 mi. railroad at Steel Rock Lake 140 mi. west of Port Arthur, $50,000,000.

Ont., Malton—PLANT—A. V. Roe Canada Ltd. Malton, 90,000 sq. ft. plant expansion office and gas turbine experimental section, $600,000.

UNCLASSIFIED

Fla., Pensacola—GAS PIPE LINE—City, O. J. Semmes, Jr. mgr., City Hall, gas pipe line, $500,000 Spencer Johnson, supt. gas operations.

▲ **Ga., Augusta**—GAS DISTRIBUTION SYSTEM—Atlanta Gas Light Co., Peachtreee St. S.E., Atlanta, natural gas distr. system, Approx. $3,000,000.

▲ **Ga., Warner Robins**—NATURAL GAS SYSTEM—City, City Hall, bond election Mar. 24, natural gas system, $1,500,000. Ray R. Littrell & Assocs., 264½ N. Lumpkin St., Athens, consult. engrs.

▲ **Indiana, Ohio and Michigan**—OIL PIPE LINE—Wolverine Pipe Line Co., Cyrus S. Gentry, pres., 11 W. 42 St., New York 36, N. Y., 16 in. oil pipe line to carry gasoline and fuel oil from East Chicago, Ind. to Detroit, Mich. via Toledo, Ohio, $15,450,000.

▲ **Michigan**—GAS PIPE LINE—Michigan Gas Storage Co., subsidiary Consumers Power Co., Jackson, gas transmission pipe line 30 mi. long 26 in. diam. parallel existing pipe lines, Laingsburg Jct. to Ithaca, $2,000,000.

▲ **Ohio**—RURAL DISTRIBUTION LINES—Columbus & Southern Ohio Electric Co., 215 N. Front St., Columbus, 60 mi. new rural lines in southern district, $173,800; 34 mi. 138-kv line on private right-of-way from Poston Plant to Jackson, $39,300 to be spent in 1953, Athens and Jackson Counties, $475,-000; 69 kv transmission line from Addison substation near Gallipolis to Rock Springs sub-station near Pomeroy, Gallia and Meigs Counties, $111,000; 40 mi. 138-kv transmission line from Ross substation at Chillicothe to Adams sub-station near Peebles, Ross and Adams Counties, $212,400; 22 mi. 138-kv transmission line from Addison sub-station near Gallipolis to Rock Springs sub-station near Pomeroy, Gallia and Meigs Counties, $129,800; 138-kv transmission line, 34 mi. from Poston generating station to Lick sub-station near Jackson, Athens and Jackson Counties, $234,300; 138-kv transmission line from Adams sub-station to site of new sub-station near Peebles, Adams Co., $68,700; 138-kv transmission line 12 mi. from Pike switching station to site of new Atomic Energy Plant, Pike Co. $169,200; installing cables on all 13.2 and 40-kv underground circuits between Marion Rd. and Canal sub-stations, Franklin Co., $64,300; installing 40-kv circuit of gas pressure type cable from Marion Rd. sub-station to Canal sub-station. Franklin Co., $204,000; constr 34.5 kv transmission line from Sunbury sub-station to site of proposed Delaware sub-station, Delaware Co., $113,450; conversion of 13-kv line to 34.5 kv line between E. Broad St. sub-station and Sunbury sub-station. Franklin and Delaware Counties, $174,100; completing 34.5 kv transmission line between Clinton and Sunbury substations, Franklin and Delaware Counties, $93,150; 138-kv transmission line from Harrison station to new Wilson Rd. sub-station, Columbus, Ross, Pickaway and Franklin Counties, $563,000; 53 mi. 138-kv transmission line linking Poston and Picway generating plants, Athens and Pickaway Counties, $916,100.

▲ **Tex., Houston** — TRACKAGE, etc. — Southern Pacific Lines, L. A. Loggins, ch. engr., Southern Pacific Bldg., Zone 1, 48-track classification yards, $2,250,-000; 28-track yards for making up trains and terminal transfers, $1,250,000; flood lighting for entire 300-acre railway yards zone, $225,000; communications network, incl. sys. for loud speakers, talk-back speakers, walkie- talkie radio facilities, $175,000; service bldg. units, shop and yards area, $200,000.

▲ **Man., The Pas**—DIKING, etc.—Dpt. Agriculture, Ottawa, Ont., diking and drainage works in the Delta, at forks of Carott, Pasquia and Saskatchewan Rivers, $1,350,000. Prairie Farm Rehabilitation Bd., McCallum Hill Bldg., Regina, Sask., engr. CD 1/24/45.

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UNIT PRICES

Subway extension, Phila.

Continued from ENR, February 26, p 54

These prices continue the report on bids for the $3.2-million Market St. subway extension, Philadelphia, awarded by the city of Philadelphia to Kaufman Constr. Co., the lowest of five bidders.

All other prices, including preparatory work on the subway and adjacent buildings; concrete; vitrified clay, cast iron, wrought iron and steel pipe; and membrane waterproofing are found in ENR, February 26, p. 54.

1C Kaufman Constr. Co., Inc., Phila, Pa	$3,197,006
2 Lipsett, Inc., New York 17, N.Y.	3,829,300
5 Conduit & Foundation Corp., Pa.	4,186,600

Bids: 12-2-52 Items	Unit	Quantity	Unit Prices 1 C	2
Floor drains				
Drains with 7" brass strainer & 3" outlet	ea	7	40.00	60.00
4" beehive strainers & 4" outlet	ea	8	30.00	35.00
Urinal drains with trap, with 4½" brass strainer & 2" outlet	ea	2	30.00	50.00
Lumber	mfbm	5	250.00	400.00
Furnishing new cast-iron pipe				
Bell & spigot straight pipe	ton	27	200.00	200.00
Bell & spigot sp cstngs	ton	4	450.00	500.00
High-press CI strt pipe	ton	15	200.00	250.00
High-press special cstngs	ton	3	350.00	500.00
Mechanical joints, straight CI pipe	ton	75	200.00	175.00
Mech joints, sp cstngs	ton	10	620.00	500.00
Laying cast-iron bell & spigot and/or mechanical joint pipe and specials				
3" or 4"	lf	50	5.00	4.00
6"	lf	100	5.00	5.00
8"	lf	30	6.00	6.00
10" or 12"	lf	1,700	6.00	9.00
14"	lf	20	10.00	12.00
18"	lf	50	10.00	15.00
24"	lf	200	10.00	20.00
Laying any type 12" high pressure water pipe	lf	60	12.00	10.00
16"	lf	75	15.00	15.00
Rem CI bell & spigot pipe and specials	ton	10	50.00	100.00
Rem any type high pressure pipe	ton	55	60.00	100.00
Bell and/or mechanical joint gate vales				
3" or 4" gate valves	ea	2	100.00	60.00
6"	ea	6	120.00	100.00
12" gate valves	ea	12	350.00	300.00
New lead water service connections				
⅝" lead pipe	lf	100	5.00	7.00
¾" lead pipe	lf	150	5.00	9.00
1" lead pipe	lf	100	6.00	9.00
1¼" lead pipe	lf	50	6.00	10.00
1½" lead pipe	lf	50	8.00	11.00
2" lead pipe	lf	75	10.00	11.00
New brass or copper water service connections				
½" pipe	lf	100	5.00	6.00
¾" pipe	lf	100	5.00	8.00
1" pipe	lf	450	6.00	9.00
1¼" pipe	lf	50	7.00	10.00
1½" pipe	lf	50	8.00	11.00
2" pipe	lf	75	10.00	12.00
Cement-asbestos ducts, straight & curved				
3" std wall thickness	df	1,000	0.75	0.75
3"thin wall thickness	df	500	0.70	0.75
4" std wall thickness	df	1,000	0.85	1.00
4" thin wall thickness	df	500	0.80	0.90
Vitrified clay ducts				
3" ducts	df	2,500	0.50	0.70
3½" ducts	df	37,000	0.55	0.70
4" ducts	df	200	0.60	0.80
Vitrified clay ducts of split composite section, laid around cables				
3"	df	2,000	0.65	0.85
3½"	df	3,000	0.70	0.92
4"	df	200	0.80	1.10
3" or 4" fibre ducts, except exc, conc & manholes	df	200	0.70	0.70
4" fibre ducts of split comp sec, excp exc, conc, MH	df	100	1.00	0.75
Galv std stl pipe electrical cond, except conduit fittings boxes and covers				
½" or ¾"	lf	200	0.90	0.90
1"	lf	7,000	1.55	1.40
1½"	lf	1,000	2.20	2.00
2"	lf	200	2.70	2.50
Galv cast-iron boxes, or sheet metal boxes				
4" to 6" round, 3½" deep, for 1" conduit, galv CI boxes and covers	ea	100	17.00	20.00
4" to 6" round, 3½" deep, for 1" cond, galv CI boxes	ea	120	16.00	20.00
4" round, 2" deep, CI boxes for 1" cond, incl form for entrance stair sidewall lighting fix	ea	8	17.00	20.00
FD type, CI switch boxes, 4⅝" by 2⅝" deep for 1" cond with CI covers	ea	40	17.00	25.00
18" by 2½" by 2½" galv sheet stl pull boxes for 1½" or 2" cond with sheet metal covers	ea	5	25.00	25.00
Galv cast or malleable-iron cond fittings, std or mogul and covers with gaskets				
½" or ¾" std	ftg	20	6.00	10.00
1" std	ftg	20	7.50	10.00
1½" std	ftg	10	13.50	15.00
2" std	ftg	10	18.00	18.00
1½" mogul	ftg	10	26.50	30.00
2" mogul	ftg	10	33.50	35.00
Tem lighting system	ls	1	3,200	10,000
F & L 3½" creosoted wood cond of split comp sec, incl connec to MH	df	100	2.25	4.00
Furnish and lay permanent roadway paving				
Sheet asphalt pavement	sy	320	2.50	4.00
Smooth dressed granite block pvmnt, with bit mastic filler	sy	10	15.00	25.00
Vit block pvmnt with bit joint filler	sy	10	10.00	20.00
Tem bri sidewalk, incl exc cinder base	sy	10	5.00	15.00
F & L new smooth dressed granite blocks	sy	10	15.00	20.00
Relaying old gran blocks	sy	10	10.00	15.00
Tem rdwy pvng using bit conc cold mix, incl roll subgrade and furn & roll stone base	sy	5,100	3.50	4.00
Relay smooth dressed gran blocks with bit mastic filler and sand bed	sy	220	6.00	15.00
Relay redressed gran blocks with cmt grout or bit mastic filler	sy	10	8.00	15.00
6" straight gran curb	lf	240	8.00	9.50
8"	lf	1,400	9.00	10.00
8" curved granite curve	lf	160	10.00	12.00
Reset curb, incl exc	lf	40	4.00	10.00
New 1 crse conc sdwlks	sy	2,800	5.00	6.00
Clean cinders	cy	100	5.00	5.00
F & L conc driveway, paving 7½" deep, std PC	sy	140	5.00	10.00
high-early PC	sy	30	6.00	11.00
Safety treads	sf	430	8.00	10.00
Woven wire copper strainer for drains	ea	10	2.00	6.00
Sheet copper, at ventil well openings & const joints	lb	200	2.00	2.00
F & I premoulded asphalt mastic expansion joints	sf	300	1.50	1.00
F & I 14 stl doors & frames	ls	1	7,000	6,000

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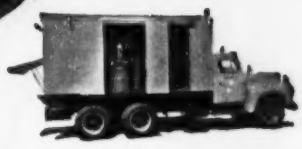

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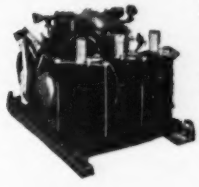

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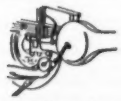

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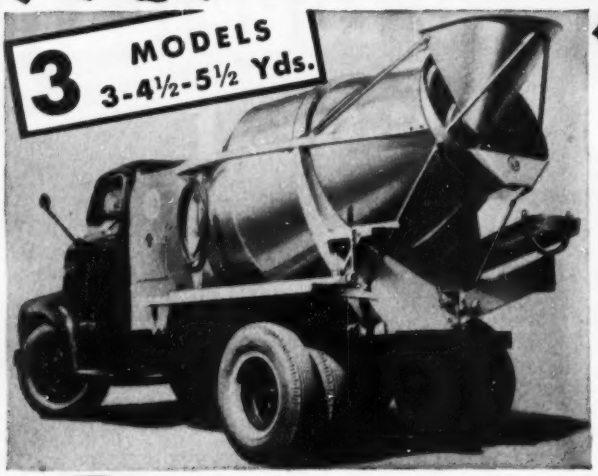

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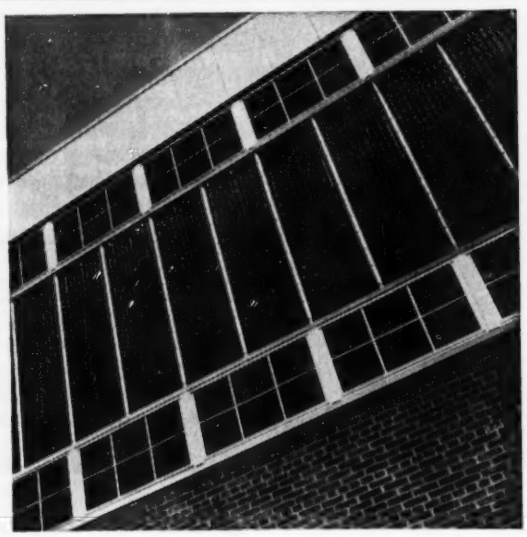

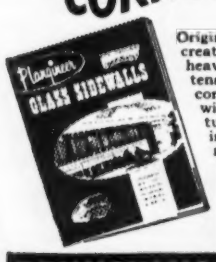

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E-33

NAME_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
March 16 Connecticut
STREETS AND ROADS
March 16 Connecticut

BIDS ASKED—BUILDINGS

▲ **Conn., Hartford**—POLICE, ADMINISTRATION, COURT—B.A. 3/26—City, c/o N. B. Henson, purch. agt., Municipal Bldg., 350 Main St., 4 story, brick, steel, concrete, police-administration and court bldg., Old Brown St. School, Market St. $1,500,000. Plans deposit $50. Henri Von Zelm Assoc., 197 Asylum Ave., engrs. Willard Wilkins & Maurice Golden, 945 Asylum Ave., archts. CD 1/15.

▲ **Mass., Natick**—SCHOOL—BA. 4/18—Town, Supt. Schools, S. Main St., Senior High School. $3,500,000. Plans deposit $150. Extended date. Edwin P. Mahard, 473 Statler Bldg., Boston, Mass., elec. engr. Coolidge-Shepley, Bulfinch, Richardson & Abbott, and Smith & Sellew, 1 Court St., Boston, Mass., archts. CD 3/3.

BUILDINGS

LOW BIDS AND CONTRACTS

City, Dpt. P. Wks., City Hall, Holyoke, Mass., rejected bids, contract award rescinded City HOSPITAL, Mass. 46-C, Lower Westfield Rd., HOLYOKE, MASS., CA, $922,630. CD 1/26, under CA.

John A. Volpe Constr. Co., 54 Eastern Ave., Malden, Mass., CA, $994,000, men's DORMITORY, MEDFORD, MASS., Tufts College, Administration Office, Medford, Mass. CD 1/27, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
March 19, 24, 26 New Jersey March 26 New York
STREETS AND ROADS
March 17 Maryland March 19, 23, 26 New Jersey
March 26 New York

BIDS ASKED—BUILDINGS

▲ **N. Y., Verona**—HIGH SCHOOL—B.A. 3/20—Bd. Educ., Central School Dist., Verona, Junior-Senior High School. $2,300,000.

▲ **N. Y., Brooklyn**—HOSPITAL—B.A. 4/15—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Coney Island Hospital. $12,000,000. CD 6/28/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Joseph Nebel Co.,** 2142 P St. N.W., Wash., D. C., LB, $1,288,000 XC-7, steam catapult facilities, Naval Air Station, NOY 18666, PATUXENT RIVER, MD. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids Mar. 4. CD 2/18.

▲ **Leo Butler,** 9217 51st Ave., College Park, Md., LB $1,226,601, overpass E. Capital St. and Kenilworth Ave., WASH., D. C. Dist. of Columbia, Hys. Dpt. 499 Penna. Ave. N.W., Wash. D. C. Bids Feb. 26. CD 1/26.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Cauldwell Wingate Co.,** 101 Park Ave., New York 17, N. Y. LB $7,112,000, general constr.;
Jesse E. Kahn, Inc., 242 W. 20 St., New York 11, N. Y., LB $759,280, sanitary contract;
Herman H. Schwartz, Inc., 179 S. Portland Ave., Brooklyn 17, N. Y., LB $1,049,740, electrical contract;
received no bids Feb. 26 for heating for BASIC SCIENCES bldg., State University Medical Center, Kings Co., BROOKLYN, N. Y. Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, N. Y. Bids Feb. 26. CD 2/19.

▲ **Jonwal Constr. Co., Inc.,** 1527 Franklin Ave., Mineola, N. Y., CA $1,624,012, general constr.,
James H. Martin, Inc., 503 W. 43 St., New York, N. Y. CA. $303,416, heating and ventilating for Wantagh HIGH SCHOOL, WANTAGH, N. Y. Bd. Educ., Union Free School Dist. 23, Wantagh, N. Y. Bids Feb. 13, awarded Mar. 6. CD 1/29.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
March 20 Kentucky
STREETS AND ROADS
March 19 Virginia March 20 Kentucky

SOON LETS CONTRACT—BUILDINGS

▲ **Fla., West Palm Beach**—HOSPITAL—St. Mary's Hospital, Mother Josephine, administrator, 900 W. 49 St., soon lets contract. 3 wing addn., 3 story RIC. $1,500,000. Skidmore, Owings & Merrill, 575 Madison Ave., New York, N. Y., engrs. CD 2/10.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NORTH CAROLINA**—State Hy. & P. Wks. Comn., Raleigh,
A. B. Burton & Co., Inc., Box 817, Lynchburg, Va., CA $1,464,676. Prop 1, grading, drainage, tunnel excav. 6.59 mi. on Tennessee-North Carolina State Line northeast of Waterville, southeast to point near Cold Springs, Proj. 9461, Haywood Co. CD 2/27, under LB.

▲ **Farnsworth & Chambers Co.,** P. O. Box 74, Houston, Tex., CA $1,242,352, L. S. V. stadium addn., BATON ROUGE, LA. Louisiana State University, Baton Rouge, La. Bids Feb. 27, awarded Feb. 28. CD 1/23.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Victor R. Beauchamp,** 6837 Fourth St. N. W., Wash., D. C., CA. $1,157,840, const. 148-unit HOUSING, N. Columbus St., ALEXANDRIA, VA. Alexandria Housing & Redevelopment Auth., 131 Belvoir St., Alexandria, Va. Awarded Mar. 2. CD 1/6, under LB.

▲ **Graham Bros.,** 906 Southern States Bldg., Richmond, Va. CA $1,127,300, group DORMITORY bldg., FREDERICKSBURG, VA. Mary Washington College, University of Virginia, Frederickburg, Va. Bids Feb. 19, awarded Feb. 24. CD 2/26, under LB.

▲ **Ben J. Massell,** 40 Pryor St., S.W., Atlanta, Ga., Owner Builds, $1,000,000, OFFICE, Peachtree St., ATLANTA, GA.

▲ **Henry C. Beck Co.,** First National Bank Bldg., Atlanta, Ga. CA. Approx. $3,000,000, film mfg. PLANT, CHAMBLEE, GA. Eastman Kodak Co., 343 State St., Rochester, N. Y. Armistead & Saggus, Candler Bldg., Atlanta, Ga., archts. CD 12/11.

▲ **Geo. D. Auchter Co.,** P. O. Box 1193, Jacksonville, Fla., LB, $1,357,670 HOSPITAL addn., JACKSONVILLE, FLA. St. Vincent's Hospital, c/o Reynolds, Smith & Hills, archts., 227 Park St., Jacksonville, Fla. Bids Feb. 17. CD 1/26.

▲ **Rust Eng. Co.,** Exchange Bldg., Birmingham, Ala., CA, approx. $2,700,000, oil processing PLANT addns., BAY MINETTE, ALA. Newport Industries, Bay Minette, Ala.

▲ **Highbaugh Realty Co.,** 509 W. Market St., Louisville, Ky., Owner Builds, $1,500,000, 150 RESIDENCES, LOUISVILLE, Ky.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
March 24 Wisconsin
STREETS AND ROADS
March 24 Ohio, Wisconsin

BIDS ASKED—BUILDINGS

▲ **Ind., Columbus**—WAREHOUSE, etc.—B.A. 3/17—Public Service Co. of Indiana, 1000 Main St., Plainfield warehouse and office, $1,500,000. Naess & Murphy, 80 E. Jackson Blvd., Chicago, 4, Ill., archts. CD 12/10.

▲ **O., Columbus**—DORMITORY—B.A. 3/19—Ohio State University, N. High St., 5 story 2,000,000 cu. ft. brick, concrete, steel womens dormitory. $2,000,000. Plans deposit $25. Howard Dwight Smith, 1950 Arlington St., archt. CD 1/24/52.

▲ **O., Columbus**—CIVIC CENTER—B.A. 3/31—Franklin County Veterans Memorial Assn., 280 E. Broad St., steel, concrete, stone masonry civic center, $3,200,000. Extended date. CD 2/4.

SOON LETS CONTRACT—BUILDINGS

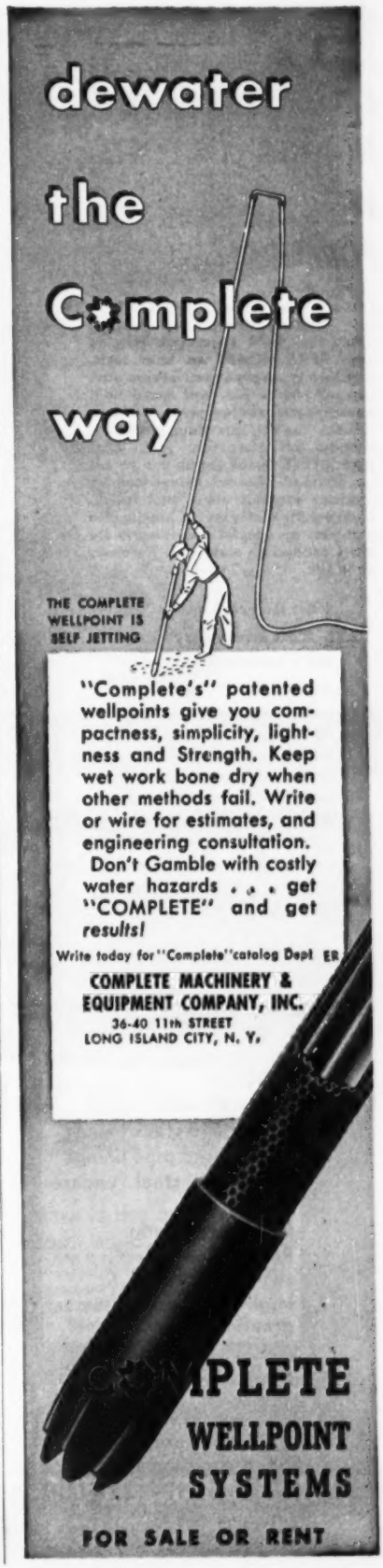
▲ **Ill., Chicago**—FREIGHT HOUSES—Chicago, Burlington & Quincy R.R., H. A. Aalberg, ch. engr., 547 W. Jackson Blvd., Zone 6, soon lets contract two 2 story, 60x1400 ft. freight houses with platform 50x1400 ft. between. $4,000,000. Shaw, Metz & Dolio, 208 S. La Salle St., Zone 4, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Christopher Constr. Co.,** 40 W. Gay St., Columbus, O., CA. $1,306,539, WW addn., NEWARK, O. City, City Hall, Newark, O. Awarded Feb. 17. CD 2/9, under LB.

▲ **MICHIGAN**—State Hy. Dpt., Charles M. Ziegler, comr., 222 Townsend St., Lansing, Zone 13,
Louis Garavaglia, 24240 Mound Rd., Center Line, Mich. and **Dcton Constr. Co.,** 7-170 General Motors Bldg., Detroit, Mich., LB $1,289,200, est. $1,720,000, grading, drainage 0.114 mi. and 36 ft. concrete pave service roads, ramps and utilities, 0.869 mi. G-D dual 36 ft. concrete pave, ramps, service, roads, utilities, BUI 82-64 C28 (BUI-391 52), BUI 82-65 C7 (BUI-391 52), Wayne Co.;
Mancini Constr. Co., East Detroit, Mich., LB $354,243, est. $500,000, water main in tunnel across Edsel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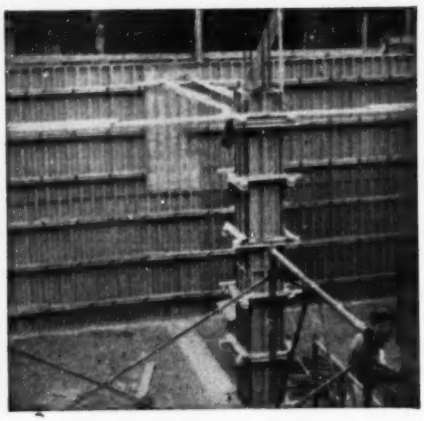

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Blue Water Excavating Co., Port Huron, Mich., LB **$114,121**, base repair and aggregate surf. 2.733 mi. M-154, M77-34-C6, St. Clair Co.;

Frisinger Co., Ann Arbor, Mich., LB **$128,828**, est. $150,000, grading, drainage, structures, pavement 0.4 mi. Middlebelt approaches to grade separation, CS 82-176 C2 (S-160 8), Wayne Co.;

Sargent Constr. Co., 2840 Bay Rd., Saginaw, Mich., LB $398,088, est. $420,000, grading, drainage, structure and 10 in. thick uniform concrete pavement 1.336 mi. U. S.-223, M 56-6 C10, Lenawee Co. Bids Feb. 25. CD 2/4, 2/12, 2/17.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Arthur G. McKee & Co.**, 2300 Chester St., Cleveland, O. CA. **$10,000,000**, 1,350 tons per day BLAST FURNACE, STOCKHOUSE and equip., CLEVELAND, O. American Steel & Wire Co., Div. U. S. Steel Corp., Rockefeller Bldg., Cleveland, O. CD 12/2.

▲ **Wermuth, Inc.**, 1036 St. Marys Ave., Ft. Wayne, Ind. CA, **$2,000,000** 170,000 sq. ft. card mfg. PLANT, GREENCASTLE, IND. International Business Machine Co., 420 E. Jefferson St., Detroit, Mich. Bids Feb. 21, awarded Feb. 23. CD 2/10.

▲ **Hunzinger Constr. Co.**, 4541 124 St., Milwaukee, Wis., CA, **$2,000,000**, WAREHOUSE and OFFICE, 320 S. 1st St., MILWAUKEE, WIS. Joseph T. Ryerson & Sons, Inc., 2550 W. 16 St., Chicago, Ill. Bids Feb. 2, awarded Feb. 25. CD 1/21.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Tex., Galveston**—B.A. 4/9—City, City Hall, sewage disposal plant, $2,700,000. Joe J. Rady, Box 172, Baytown, engr. CD 4/30/52.

BIDS ASKED—BUILDINGS

▲ **Kan., Manhattan**—STUDENT UNION—B.A. 3/17—State Bd. of Regents, Topeka, student union bldg., Kansas State College, $1,500,000. Extended date. John Brown, Topeka, state archt. CD 10/17.

▲ **Tex., Tyler**—STORAGE, WAREHOUSING, etc.—Bids Asked—General Electric Corp., River Rd., Schenectady, N. Y., storage or warehousing, $200,000; mfg. plant, $1,500,000. Walter Kidde, 1205 Holman St., Houston, engr. CD 2/10.

SOON LETS CONTRACT—BUILDINGS

Tex., Galveston—DEPARTMENT STORE—soon lets contract—E. S. Levy Co., 2227 Postoffice St., 3 story, part bsmnt., 60,337 sq. ft. concrete frame and fdn. department store. $750,000. Irving R. Klein & Assoc., 1317 Austin St., Houston, archts. Walter P. Moore & Reg. F. Taulor, Bankers Mortgage Bldg., Houston, engrs. CD 3/2.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Ia., **The Massman Constr. Co.**, 20 W. 9 St., Kansas City, Mo., and **The J. A. Jones Constr. Co.**, 209 W. 4 St., Charlotte, N. C. CA. **$17,525,046**, est. $18,764,799, powerhouse substructure, the spillway (complete) and the balance of the earthwork, for stage II, Gavins Point Proj., near Yankton, Inv. 25-066-53-155, South Dakota. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Jan. 30. CD 2/2 under LB.

▲† **Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Ia., LB **$4,489,547**, est. $5,057,217, Part II, removal and new runway and taxiways;

George M. Meyers, El Dorado, Kan., LB **$90,614**, est. $90,936, Alternate Bid for flexible pavement runway and taxiways, ENG 23-028-53-77, Wichita Air Force Base., WICHITA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Feb. 26. CD 2/10.

▲ **TEXAS**—State Hy. Comn., Austin,

Public Constr. Co., P. O. Box 380, Denton, Tex., CA. **$598,682**, hot mix b. conc. 65.874 mi. Hy. SH 24, US 271, 69, Proj. C 135-7-6, C 136-1-23, C 136-3-18, C 136-4-12, C-221-25-C 136-7-19, C 202-5-8, C 221-1-16, C 221-3-33, C-410-1-8, Hunt, Delta, Lamar, Red River and Grayson Counties;

W. O. Pelphrey, 1412 Electric Bldg., Fort Worth, Tex., CA **$811,607**., flexible base, hot mix, b. conc. pavement and G. C. and S. F. Ry. overpass 1.727 mi. Hy. U. S. 81, and ST 36, Proj. 1664 (7) and IG 664 (8), Bell Co. Bids Feb. 17, awarded Feb. 24. CD 2/25, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **J. E. Dunn Constr. Co.**, 929 Holmes St., Kansas City, Mo. Owner Builds. **$1,250,000**, 1st Phase, Dunleith Towers, 10-story APARTMENT 80 luxury units, 46 and Jefferson Sts., KANSAS CITY, MO. Swanson, Terney & Brey, 216 E. 10 St., Kansas City, Mo., archts.

▲ **I. E. Millstone Constr. Co.**, 4343 Clayton Ave., St. Louis 10, Mo., LB, **$4,367,000**, general contract;

Gartland Plumbing Co., 1021 Big Bend St. Louis 17, Mo., LB, **$669,786**, plumbing work;

Sodeman Heat & Power 2306 Delmar Blvd. St. Louis 3, Mo., LB, **$748,886**, heating for 602 DWELLING UNITS, southeast of Jefferson and Cass Aves., Sect. I of Proj. Mo. 1-5, ST. LOUIS, MO. St. Louis Housing Auth., John J. O'Toole, exec. dir. 901 W. Washington Ave., St. Louis, Mo. Bids Feb. 26. CD 1/30.

▲ **Campbell-Lowrie Lautermilch,** 400 W. Madison Ave., Chicago, 6, Ill., CA. $2,000,000. PROCESSING PLANT and production unit, SPRINGFIELD, MO. Kraft Foods Co., 500 N. Peshtigo Ct., Chicago, 11, Ill. Bids Jan. 27, awarded Feb. 25. CD 1/15.

▲ **Phoenix Development Co.,** Sidney, Neb., Owner Builds. $1,000,000. 100 DWELLINGS units, SIDNEY, NEB.

▲ **Refinery Eng. Co.,** Wright Bldg., Tulsa, Okla., CA $1,750,000, revamping and expansion of REFINERY, CUSHING, OKLA. Midland Co-operative Wholesale, Cushing, Okla. CD 4/15.

▲ **Premier Petroleum Co.,** Mt. Olivet Rd., Fort Worth, Tex., Own Forces. $975,000, catalytic CRACKING REFINERY unit; $350,000. catalytic POLYMERIZATION REFINERY unit, FORT WORTH, TEX. CD 2/18.

▲† **U. S. Eng.,** Box 61, Tulsa 2, Okla. cancelled bids to have been opened Mar. 10 (1) overall grading and dirt work in plant zone, $45,000 (2) eight 31,000 sq. ft. each warehouses, $1,600,000 (3) water sys., electrical distr. lighting, $75,000 (4) b. conc. paved access roads, $80,000 (5) 8 in. concrete type loading aprons with curbs and gutters, $60,000 (6) four railway spur tracks, $62,500 (7) area drainage structures, $75,000, Inv. No. Eng 34-066-53-100. RED RIVER ARSENAL, TEXARKANA, TEX. Will readvertise. CD 2/26.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
March 18, 25 California March 24, Idaho
STREETS AND ROADS
March 18, 19, 25 California

▲† **Idaho, Mountain Home**—BARRACKS, etc.—B.A. 3/25—U. S. Eng., City-County Airport, Walla Walla, Wash., 9 airmen's barracks, special vehicles bldg., 2 mess and administration bldgs., Mountain Home Air Force Base, INV. 53-49. $3,500,000. Previous bids advertised Inv. 53-28. CD 1/28, under LB.

BIDS ASKED—BUILDINGS

▲ **Wash., Sunnyside** — SCHOOL — B.A. 3/28—School District 201, Sunnyside, five 1 story, steel masonry high school buildings, $1,000,000. Plans deposit $50. W. H. Rother, 806 W. Yakima Ave., Yakima, archt. CD 1/14.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Hall-Atwater Co.,** 605 13 Ave., Seattle, Wash., LB. $1,397,500, eight 52x103 ft., rein.-con. gun ammo MAGAZINES three 22x29 ft. fuse and detonator magazines, ten 31x83 ft. high explosive magazines, three 50x203 ft. storehouses, Naval Ammunition Depot, Spec. 35614, BANGOR, WASH. P. Wks. Officer, Thirteenth Naval Dist., 1611 W. Wheeler St., Seattle, Wash. Bids Feb. 25. CD 2/4.

▲ **Howard S. Wright & Co.,** 414 Pontius St., Seattle, Wash., CA. Est. $1,500,000 general contract 4 story, part bsmnt., 120x292 ft., rein.-con. OFFICE, SEATTLE, WASH. Pacific Telephone & Telegraph Co., 3 Ave. and Seneca Sts., Seattle, 1, Wash. Bids Feb. 26. CD 2/17.

▲ **Joseph Bettancourt,** 1015 San Mateo Ave., San Bruno, Calif., LB, $1,725,276 Capuchino High SCHOOL Unit No. 4, SAN BRUNO, CALIF. San Mateo High School Dist., Bellevue Ave. and Delaware St., San Mateo, Calif. Bids Feb. 25. CD 2/6.

CANADA

BIDS ASKED—BUILDINGS

▲ **B. C., Vancouver**—PROVINCIAL HEALTH—B.A. 3/25—Vancouver General Hospital Bd., Vancouver, and Dpt. P. Wks., Parliament Bldgs., Victoria, foundations and drainage for 7 story, bsmt., rein.-con. provincial health bldg. $1,700,000 Plans deposit $15. C. D. Campbell, Parliament Bldgs., Victoria, B.C., provincial archt. CD 8/29/47.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Redfern Constr. Co., Ltd.,** 36 Toronto St., Toronto, Ont. CA, $1,284,936, 134 multiple dual purpose row HOUSING UNITS, Air Force Base, Downsview, TORONTO, ONT. Central Mortgage & Housing Corp., 40 Eglinton Ave. E., Toronto, Ont. Bids Nov. 25, awarded Feb. 26. CD 11/12.

BUILDINGS

LOW BIDS AND CONTRACTS

McKay-Cocker Constr. Co., 230 Dundas St., London, Ont., CA, $600,000, adding 2 storys to Victoria HOSPITAL, LONDON, ONT. Victoria Hospital Trustees, T. F. Kingsmill, chn., 391 South St., London, Ont. CD 2/2/45.

▲ **Putherbough Constr. Co.,** 320 Colborne St., London, Ont., CA, Est $2,000,000, 5 story brick, steel department STORE addn., LONDON, ONT. Simpson's Ltd., 149 Dundas St., London, Ont. Awarded Feb. 28. CD 2/17.

▲ **A. Provencher, St. Lambert, Que.** Owner Builds, $1,000,000, 100 concrete brick COTTAGES, on various sites, PREVILLE, QUE.

(Proposal Advertisements see p. 107 to 110)

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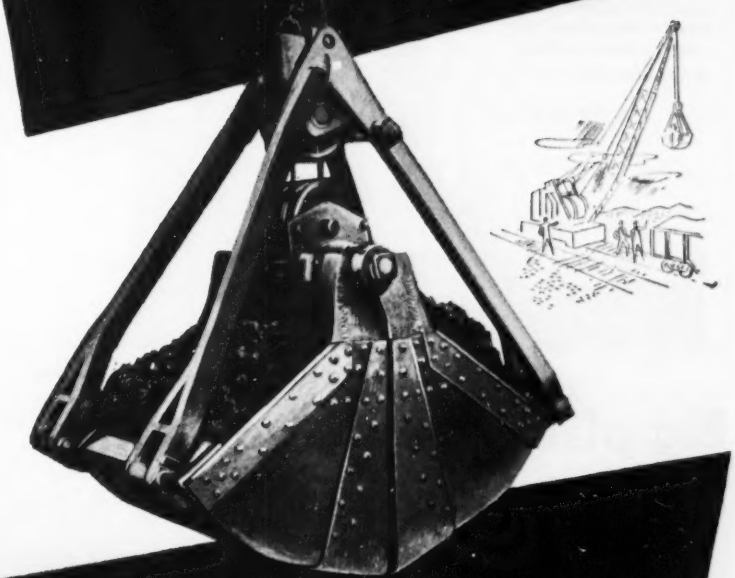

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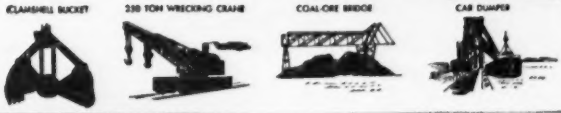

coast TO coast

9

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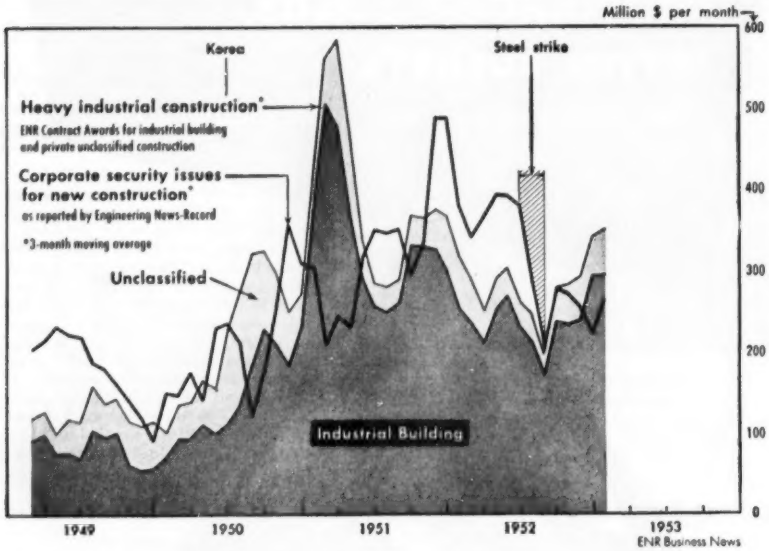


Big plant swells two-month industrial award totals

But contracts aren't expected to continue at such a record clip for remainder of current year

Because of a large contract award for an electric power plant, contract awards reported to ENGINEERING NEWS-RECORD in the first two months of 1953 for industrial building and private unclassified construction were 42% higher than the same period last year.

The increase all comes in industrial building, with $761 million in awards, 53% ahead of 1952. This is a near-record rate; the record was set in the first months of 1951 when the rush came in contracts for industrial defense plants.

But industrial building isn't expected to continue at this clip through 1953.

The bulge was caused by the contract let during January for the $280-million electric power plant at Madison, Ind., for Indiana-Kentucky Electric Co. Total contracts in the public utility field totaled $348 million, about 3½ times what they were last year.

The second largest category of industrial building is the process industries—notably chemicals and aluminum. Here, building awards so far almost exactly equal last year's high level: $236 million now, as against $235 million in the first two months of 1952.

Among other types of industrial building, food industries are continuing the upturn started in 1952. In the first two months, contracts totaling $43 million are more than four times the volume in the 1952 period. There's a slight decline in awards for machinery and parts plant construction, which total $48 million. And there's a greater drop in metal refining and rolling plants, off by one-third from a year ago with a total of $44 million.

Private unclassified construction—mainly pipelines and transmission lines—makes up the non-building side of industrial construction. This type of work is running close to the 1952 and 1951 levels; it's off 4% from last year. Contract awards total $120-million.

• **1953 outlook bright**—The outlook is bright for the rest of 1953, both in industrial building and pipeline construction.

ENGINEERING NEWS-RECORD's backlog of industrial building at the end of February was $10.5 billion, up $1.2 billion from a year ago.

For private unclassified construction, the backlog was $7.4 billion, a gain of $1.1 billion since the end of February, 1952.

An even better sign: New proposed work has been flowing into the backlog for both these types at a very fast clip so far this year. Dollar cost of new industrial buildings proposed in the first two months was $619 million—51% more than in the comparable 1952 period. An even greater increase came in proposed private unclassified projects. New work costing $283 million was proposed, 83% above the same 1952 period.

Another indicator of the future trend of industrial construction is the increase in corporate security flotations to finance new construction. Total sales for this purpose are $637 million during the first two months, up 13% from a year ago. Public utility companies account for more than half of this.

• **Utility plans**—It is understandable when planned expenditures for new construction by the electric utilities, and natural gas pipelines are considered.

Electric utilities plan to spend a record $4.2 billion for construction this year, according to a survey made early this year by Electrical World, a McGraw-Hill magazine. That's 12% above last year.

Natural gas pipelines are also scheduling a record expansion. Pipeline construction this year is estimated at nearly $1.7 billion, according to the American Gas Assn.

Oil companies also plan record capital expenditures, a good deal of it for new pipelines and additional refinery capacity. According to the Petroleum Administration for Defense, the oil companies programmed 19,700 mi of pipeline for the 18 months from July, 1952, to the end of this year. Estimated total cost is given as $740 million.

As of the start of 1953, more than two-thirds of this expansion was not yet complete, leaving over $500-million worth to be finished this year.

Savings outlook good, bankers believe

Last week in New York City, U. S. bankers talked about the long-term outlook for personal savings—and found it good. Wendell T. Burns, who is senior vice-president of the Northwestern National Bank, Minneapolis, told the annual savings and mortgage conference of the American Bankers Assn. that savings deposits in U. S.

commercial and savings banks had increased $4.8 billion in 1952 to a total of $63.5 billion.

Shares of savings & loan associations, said Burns, had increased $3.1 billion during the year to a total of $19.1 billion—a gain of about 19% as compared with 8% for banks. Policy holders' equities in life insurance policies—the most accurate method of figuring how much savings are going into life insurance—increased about 8% during 1952 to a total of about $62 billion.

Burns pointed out that savings banks invest nearly half of their deposits in mortgages. He estimated that, at the year end, commercial banks had loaned $15.7 billion on mortgages. That's more than 300% of what their loans were at the end of 1945.

What interests construction men is: Will this trend continue? Dr. E. Sherman Adams, an economist who works for the ABA, believes that it will not only continue but that volume of savings will increase.

Dr. Adams told the ABA conference that the increase in actual savings by the average American family has lagged way behind its capacity to save. And he pointed out that although the number of savings accounts has increased by 50% in the last decade, "There are still millions of people who have no savings who could afford to save."

Once people become convinced that prices are leveling off, Adams pointed out, they will have a much stronger incentive to save than they have had for some time. That's because inflation reduces the purchasing power of dollars put away in savings accounts.

This incentive may be taking effect already. In January, sales of E-bonds were greater than turn-ins; that's the first month since Korea that this had happened. Last week, the Treasury announced that its February sales also exceeded turn-ins. This trend seems to show that people are beginning to get more confident about the purchasing power of the dollar.

Central Valley Project repayment plan scored

The California Legislature's water problems committee, at a three-day meeting in San Francisco, heard considerable criticism of the Bureau of Reclamation's program for repayment of the $580-million cost of the Central Valley Project.

Some witnesses expressed the fear that the bureau had set CVP power rates so low that financial feasibility of the project was in jeopardy, and might result in burdensome levies on irrigation water users.

At one point in the hearing, M. J. Dowd, employed by the California Water Project Authority as a consulting engineer, accused the bureau of spending nearly $30 million on facilities not authorized by the Congress.

Dowd, who is an engineer for the Imperial Irrigation District, cited the Delta-Mendota Canal construction as an example. He declared the congressional authorization was for a canal to handle a water flow of 2,300 cfs, but the bureau went ahead and constructed a 4,600-cfs capacity channel.

A. N. Murray, regional planning engineer for the bureau with headquarters in Sacramento, Calif., informed the committee he was not prepared to argue whether the bureau had the legal right to enlarge the canal's capacity but he said California will benefit greatly by it. He said it will make possible much larger deliveries of water from the Sacramento Valley into the water-deficient San Joaquin Valley inasmuch as more water will become available from Folsom Dam and possibly from future units to be constructed in the Sacramento Valley.

Information was given to the committee that $29 million expected to be repaid for CVP construction costs will be from water sales which cannot be provided without the authorization of additional project facilities. It was asserted that if the facilities are not authorized the repayment would be made from surpluses which would result from the water and power sales now planned.

The bureau's repayment plan calls for a $136-million contribution by irrigation, $329 million by power, and $36 million from water sold for municipal and industrial use at $10 an acre-ft.

The repayment period extends until the year 2005 for water, irrigation, municipal and industrial use, and to the year 2011 for power facilities. Witnesses protested the bureau's repayment schedule as a block to the much discussed plan for state acquisition of the CVP.

William M. Harrison, chairman of a statewide committee for California ownership of the Central Valley Project, took the lead in advocating state purchase of the project, and declared it was an opportunity for the state to eliminate federal domination and "set an example for the rest of the nation in sound reclamation project practices."

Plan new Delaware River bridge

Meeting in Philadelphia recently, top officials from Pennsylvania and New Jersey discussed plans to build a $25-million bridge across the Delaware River, linking the New Jersey and Pennsylvania Turnpikes. It would be built north of Bristol, Pa. and Florence, N. J., within two years. Shown above conferring on the plans are: James F. Torrance, secretary of the Pennsylvania Turnpike Commission; Gov. Alfred E. Driscoll, of New Jersey; Gov. John S. Fine, of Pennsylvania, and Paul L. Troast, chairman of the New Jersey Turnpike Authority.

More sentenced in San Diego VA frauds

Savings and loan chairman and vice-president jailed as government prosecution nears end

The federal government virtually has wound up its prosecution of frauds in the Veterans Administration Insured Home Loan Program at San Diego, Calif. (ENR Dec. 4, 1952, p. 120). Latest to be sentenced are officers of a local savings and loan association, a VA appraiser, a lawyer and officers of a construction firm which has done a lot of home building in the area.

Roy E. Hegg, who has been board chairman of the San Diego Federal Savings & Loan Assn., got two and a half years. He failed to contest charges that he compelled local contractors to buy insurance on their housing-development tracts through an insurance agency he owned. Hegg's association had been making GI mortgage loans on houses in these developments.

Wrelton Clarke, former vice-president of San Diego Federal, got 15 months and a $7,000 fine. He failed to contest charges that he abetted Francis G. Paige, a former VA official, in doing government business with a company in which he had a financial interest. This was the California Realty & Loan Corp., an agency which serviced loans originally made by San Diego Federal and sold to the Federal National Mortgage Assn.

Dana McEwen, real estate man and former appraiser for the San Diego Regional Office of the Veterans Administration, got two years and a $7,000 fine on a similar charge. He had been an officer of California Realty & Loan.

Another defendant, Vroman J. Dorman, a lawyer who was an officer of the now defunct Grossmont Homes, Inc., did not contest his indictment and was put on probation for three years. He had been charged with helping Clarke and Alton B. Jackson, another ex-officer of San Diego Federal who is now serving a prison term, in engineering a loan from San Diego Federal by which they stood to profit personally.

• **Background**—According to the indictment, Grossmont Homes was formed by Dorman, Clarke, Jackson, and Paige, now serving a three-and-a-half-year term in connection with other charges growing out of the San Diego probe.

The indictment charged that Grossmont Homes was to develop land through financing furnished by San Diego Federal. Eventually, the association, through the efforts of Jackson and Clarke, was to make VA-insured loans amounting to about $20 million on the houses to be built on the tract.

The government charged that Paige was represented in Grossmont Homes through the use of his stepson's name, and that the amounts of the mortgages on houses in the tract were to be increased through approval by Paige of increased VA appraisals.

It was also charged that Paige had planned to allow perfunctory VA inspections that would not require full compliance with VA specifications.

After a hearing last week, the federal court has also sentenced three builders: Chris A. Cosgrove, president of the Cosgrove Construction Co.; Howard R. Mueller and Roy R. Brockbank, officials of Mobilhomes of San Diego, Inc., and formerly associated with Cosgrove. They had been convicted last November of bribing Paige.

Brockbank got three-and-a-half years and a $16,000 fine, Cosgrove one year and $10,000; Mueller was fined $10,000.

Business briefs . . .

• **MC&S raises funds**—Merritt-Chapman & Scott Corp. has registered with the Securities & Exchange Commission an issue of 121,000 shares of new common, to be offered stockholders later this month. That would provide about $3 million. The company also told SEC it was arranging a $4.5-million loan from Equitable Life Assurance Society. About half the money will go to pay off bank debt, the rest for plant expansion and working capital.

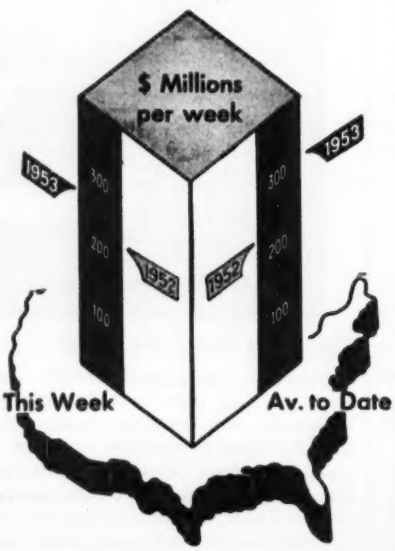
• **Prefabber makes money**—National Homes Corp. reports it earned about $820,000 in the last half of 1952. It turned out 12,000 homes last year, sent the output up about 18% from 1951, and president James R. Price says the order backlog is the biggest since the company started.

• **Lease-lend**—Tishman Realty & Construction Co. has sold its newly built Los Angeles office building group to Prudential Insurance Co. Tishman will lease the buildings back on a long-term basis with option to renew.

• **Interest rates**—California's Veterans Board says it won't boost this year the 3% interest rate on loans to veterans who finance farms and homes under the state's purchase plan, although the state has had to pay higher interest rates on money borrowed for this purpose.

Activity This Week

As reported to ENR
(in millions of dollars)



Contracts by type of work

	This Week	Cumulative 11 wks. 1953	1952	% chge
Waterworks	$6.1	$48.0	$52.7	−9
Sewerage	3.0	77.0	39.9	+93
Bridges	76.3	208.7	59.3	+262
Highways	22.3	249.0	220.8	+13
Earthwork, waterways	19.1	89.3	84.5	+6
Buildings:				
Public	24.0	361.2	333.1	+8
Housg., pub.	2.7	165.9	183.5	−10
Housg., priv.	46.5	908.7	599.9	+51
Commercial	6.9	180.5	82.8	+118
Industrial	46.1	823.5	551.5	+49
Unclassified	13.2	337.6	297.7	+13
Total	**$266.2**	**$3,449.4**	**$2,505.7**	**+38**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR indexes		Base Year = 100 1913	1926	1949
Constr. cost.	Mar.	587.44	282.38	123.15
	Feb.	587.19	282.26	123.09
Bldg. cost.	Mar.	424.89	229.68	120.78
	Feb.	425.24	229.87	120.88
Volume	Feb.	480	195	139

OFFICIAL PROPOSALS

APPEAR HERE EACH THURSDAY. PROPOSAL ADVERTISEMENTS ACCEPTED UP TO 10:30 A.M. FRIDAY FOR THE ISSUE DATED THE FOLLOWING THURSDAY. SEND ALL ADVERTISEMENTS TO CLASSIFIED ADVERTISING DIVISION, 29TH FLOOR, McGRAW-HILL PUB. CO., INC., 330 W. 42 ST., N. Y. 36, N. Y.

Bids: March 26, 1953

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 26th day of MARCH 1953, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. NICKERSON, District Engineer, 353 Broadway, Albany, New York				
Albany	C.T. 53-5	New York State Thruway-Catskill Section Subd. 5 (Volman Kill	0.11	9" Cem. Conc. Pavt. 2 at 25' Wide Br. & RR. Sep. Alpha I-Beam N. B. 448.5' S. B. 403	$52,000 Plans $10	$955,000
Rensselaer	FASS 53-2	Miller Hill Road (Proj. S384(1)	1.86	Asp. Conc. Ty 1A, Opt.	$12,000 Plans $10	220,000
Schenectady	FAC 53-7	City of Schenectady; Broadway (Edison Ave. to Thruway Spur) Proj. U655(5)	0.20	9" Cem. Conc. Pavt. 60' Wide	$6,000 Plans $10.00	103,000
		DISTRICT No. 2				
		L. KETCHUM, Dist. Engr., 109 No. Genesee St., Utica, N. Y.				
Montgomery	M.T. 53-5 ST.. 53-13	New York State Thruway- Mohawk Section, Subd. 12C (Caroga Creek-Fort Plain) Co. Rd. 65; Acc. Rd. Lock 15	Acc. 1.96 Thy. 2.26	9" Cem. Conc. Pavt. 2 at 25' Wide = 2.26 Mi. Asp. Conc. Ty. 1A, Opt. = 0.84 Mi. Gravel Surf. Rd. = 1.12 Mi. RR. Sep. Alpha I-Beam 44.5'	$140,000 Plans $25	2,852,000
		DISTRICT No. 4				
		E. G. YOUNGMANN, Dist. Eng., Barge Canal Terminal, Rochester, N. Y.				
Genesee	O.T. 53-6 S.T. 53-14 S.T.C. 53-15 R.C. 53-24	New York State Thruway- Ontario Section, Subds. 3 & 4 (Slusser Rd.-Rte. 33); 9 Town Or Co. Cross Rds. Batavia-Elba, S. H. 853; Alabama-Batavia, Pt. 2, S. H. 1402	Acc. 5.68 Thy. 11.91	9" Cem. Conc. Pavt. 2 at 25' Var. Wide = 12.37 Mi. Asp. Conc. Ty. 1A, Opt. = 2.59 Mi.; Fdn. Crse. Grav. = 2.41 Mi.; Misc. Work = 0.22 Mi.; 7 Hy. Seps., Alpha I-Beams 203.6', 268.1', 342.4', 251.3', 315.1', 207.3' & 227.4' 1 Hy. Sept. Conc. Rigid Fr. 32.8' 1 RR. Sep. Two Cont. I-Beams 195'	$400,000 Plans $100	7,150,000
Genesee	O.T. 53-5 S.T. 53-11 R.C. 53-22	New York State Thruway—Ontario Section, Subds. 1 & 2 (Erie Co. Line-Slusser Rd.) Lake Rd.; Indian Falls-East Pembroke Rd.; Corfu-Indian Falls, Pt. 2; Indian Falls-Alabama, S. H. 8245	Acc. 1.58 Thy. 0.45	9" Cem. Pavt. 2 at 25' Wide = 0.45 Mi.; Asph. Conc. Type 1A, Opt. = 1.44 Mi.; Found. Crse. Grav. = 0.04 Mi.; Misc. Work = 0.10 Mi.; 3 Hy. Seps. Alpha I-Beams, 178.5', 278', 243.7'; 1 Hy. Sep. R. C. Closed Box 32.89' 1 RR. Sep. Alpha I-Beam 192' 1 Br. R. C. Twin Box 46' 1 Br. Alpha I-Beam 177'	$135,000 Plans $50	2,505,000
		DISTRICT No. 5				
		C. R. WATERS, Dist. Engr., 65 Court Street, Buffalo, N. Y.				
Erie	FAC 53-9	City of Buffalo: Fuhrman Boulevard (High Level Br. Cont. 2) Proj. No. U750(6)	0.56	No Approach and Ramp "C" Embankment and Substructure No. Abut., Piers 25-30 and Bents 31-45	$43,000 Plans $15	774,000
		DISTRICT No. 7				
		R. W. SWEET, Dist. Engr., 444 Van Duzee Street, Watertown, N. Y.				
Jefferson	FAC 53-8	West Main Street: City of Watertown Proj. No. U1106(1)	0.75	Asph. Conc. Type 1A, Opt. = 0.71 Mi.; Misc. Work = 0.04 Mi.	$22,000 Plans $15	422,000
		DISTRICT No. 8				
		J. S. BIXBY, Dist. Engr., Pleasant Valley Rd., Poughkeepsie, N. Y.				
Orange & Rockland	C.T. 53-6 S.T. 53-12 R.C. 53-23	New York State Thruway—Catskill Section, Subd. 7 (Suffern-Harriman, Pt. 1) 12 Town or County Cross Roads Rockland Co. Line-Tuxedo, S. H. 416	Acc. 3.56 Thy. 12.84	9" Cem. Conc. Pavt. 2 at 37' Wide = 13.36 Mi.; Asph. Conc. Type 1A, Opt. = 2.02 Mi.; Found. Crse. Gravel (Cal. Chloride Treated) = 1.02 Mi.; 9 Hy. & RR. Seps. Alpha I-Beams 259.2', 289.3', 107', 104', 148' 177.5' 354', 426' & 428' 2 Brs. Alpha I-Beams 57.4' & 67.4' 1 Br. Reinf. Conc. Twin Closed Box 109.8'	$1,000,000 Plans $100	19,274,000
		DISTRICT No. 9				
		F. W. DONOVAN, Dist. Engr., 71 Frederick Street, Binghamton, N. Y.				
Schoharie	FASS 53-3	Breakabeen-Broome Center Proj. No. S368(1)	4.65	Bit. D. S. T. Graded Gravel	$18,000 Plans $15	331,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

INSURE COMPETITION

and get the lowest possible bid for your proposed work by placing your bids wanted advertising in this Section.

Don't limit competition to local bidding alone. Bring it to the attention of contractors the country over. They read this Section every week—make sure your bid is here where they can read it.

OFFICIAL PROPOSALS

Bids: April 1, 1953

Contracts C-36, C-37 and C-36 & 37

NOTICE TO BIDDERS

Sealed proposals will be received by the Ohio Turnpike Commission for the performance of Contracts C-36, C-37 and C-36 & 37. The work covered by Contract C-36 consists generally of the construction of grading, drainage, structures and paving of approximately 4.1 miles of the Ohio Turnpike beginning at a point about 750' west of Hirt Road at Turnpike Centerline Station 770+00 in Sandusky County, and extending eastwardly to a point about 1,600' east of Dalton Road at Turnpike Centerline Station 985+97 in Sandusky County. The principal structures to be built are five reinforced concrete culverts and eleven steel beam bridges of from two to four spans each, supported on reinforced concrete abutments and bents. The abutments and bents for these bridges are to be on cast-in-place concrete piles. The work covered by Contract C-37 consists generally of the construction of grading, drainage, structures and paving of approximately 4.0 miles of the Ohio Turnpike beginning at a point about 400' east of the Sandusky River at Turnpike Centerline Station 557+51.38 in Sandusky County, and extending eastwardly to a point about 750' west of Hirt Road at Turnpike Centerline Station 770+00 in Sandusky County. The principal structures to be built are two reinforced concrete culverts and seven steel beam bridges of from two to four spans each, supported on reinforced concrete abutments and bents. The abutments and bents for these bridges are to be on cast-in-paice concrete piles. The work covered by each contract shall also include the construction of engineer's office buildings and facilities on or near the site of the work.

The work covered by Contract C-36 & 37 shall be the combination of the construction as above generally described for Contracts C-36 and C-37.

Approximate quantities of the major items of construction for Contract C-36 are as follows:

Roadway Excavation	59,300 cubic yards
Borrow	1,272,300 cubic yards
Structural Concrete	14,800 cubic yards
Reinforcing Steel	2,179,000 pounds
Fabricated Structural Steel	2,903,000 pounds
10" Reinforced Concrete Pavement	108,000 square yards

Approximate quantities of the major items of construction for Contract C-37 are as follows:

Roadway Excavation	62,800 cubic yards
Borrow	875,700 cubic yards
Structural Concrete	6,080 cubic yards
Reinforcing Steel	909,000 pounds
Fabricating Structural Steel	1,752,000 pounds
10" Reinforced Concrete Pavement	109,800 square yards

Approximate quantities of the major items of construction for Contract C-36 & 37 are the sum of each of the above noted quantities for Contract C-36 and C-37.

Copies of the Plans, Specifications, and all other Contract Documents for said contracts will be available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 361 East Broad Street, Columbus 15, Ohio, and these documents may be purchased from the Chief Engineer of the Ohio Turnpike Commission for the following sums which sums are non-returnable:

General Specifications, per set	$5.00
Plans, including soil profiles and boring logs, and other Contract Documents (excluding General Specifications), per set per section	15.00
Cross Sections, per set per section	25.00

Forms or copies of Proposals for each of Contracts C-36 & 37, C-36 and C-37; of the Affidavit which must accompany any such proposal; of this Notice to Bidders; of the Special Provisions applying to said contracts; of the Contracts to be entered into with the (or each) successful bidder; and of the Contract Bond to be furnished with such contract will be furnished upon request and without charge to any interested person at the aforesaid Chief Engineer's office on and after March 16, 1953. One set (or, if required, a reasonable additional number) of said documents will be furnished without charge to each purchaser of either of the aforesaid sets of plans.

All proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Each proposal must be accompanied by a certified check on a solvent bank, payable to the order of the Ohio Turnpike Commission, in an amount not less than 5% of the total amount bid in such proposal. If the bidder bids on Contract C-36 & 37 and also on either or both of Contracts C-36 and C-37, one certified check will suffice, if in an amount not less than 5% of the total amount bid by him on Contract C-36 & 37. If a bidder bids on both of Contracts C-36 and C-37, but not on Contract C-36 & 37, he shall submit separate certified checks with each bid. The Commission may at any time cash any such check. Each such check, or the proceeds thereof, will be held by the Commission as a guaranty that, if any proposal guaranteed thereby is accepted, a contract will be entered into and the performance of the proposal secured. Each such check, or the proceeds thereof, will be returned or frofeited as provided in paragraphs G-3.03 and G-3.06 of the aforesaid General Specifications; provided that if there be a forfeiture, it shall be of an amount equal to 5% of the total amount bid in the proposal with respect to which the forfeiture occurs,, and any excess thereover will be returned to the bidder.

All bids must be received at or before 10:00 A.M., Eastern Standard Time, April 1, 1953, in the offices of the Ohio Turnpike Commission, 361 East Broad Street, Columbus 15, Ohio.

At said hour, the bid box will be removed to the Neil House Hotel, 41 South High Street, Columbus, Ohio, where all proposals will be publicly opened and read.

If the bid of the lowest and best bidder for Contract C-36 & 37 is lower and better than the bids, taken together, of the lowest and best bidders for Contracts C-36 and C-37, respectively, Contract C-36 & 37 will be awarded (if any award be made) to said lowest and best bidder for it, and no award will be made of Contracts C-36 and C-37. If the converse be true, no award will be made of Contract C-36 & 37 and Contracts C-36 and C-37, if awarded, will be awarded to the lowest and best bidders for them, respectively. Since the Commission reserves the right to reject any or all proposals, it may award either Contract C-36 or Contract C-37 to the lowest and best bidder therefor, and make no other award, or it may make no award of any of the contracts. To qualify for award, a bidder's proposal must comply with the prescribed requirements. The Commission reserves the right to waive technicalities.

OHIO TURNPIKE COMMISSION
DATED March 2, 1953

Bids: March 24, 1953

Route 27, Sec. 19, Ambrose Brook Bridge

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Route 27, Section 19, Ambrose Brook Bridge and Approaches, in Raritan Township, Middlesex County. Length 0.060 mile. The principal items of construction are:

Estimated: Bridge Items
156 cu. yds. Class "B" Concrete in Structures
12,530 lbs. Reinforcement Steel in Structures
Road Items
590 cu. yds. Roadway Excav.—Earth
112 tons Bituminous Concrete Surface
560 sq. yds. Macadam Intermediate Course
560 sq. yds. Gravel Base Course

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, March 24, 1953, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: March 24, 1953

Water Supply Main and Appurtenant Work

BRISTOL, CONNECTICUT

Sealed bids for laying Water Supply Main to Forestville will be received at office of Board of Water Commissioners, 119 Riverside Avenue, Bristol, Conn., until 2 p.m. Eastern Standard time on March 24, 1953.

Project includes laying about 15,600 ft. of cast-iron pipe 6 to 20 in. in size, pressure regulator chamber, air valve manholes, connections to existing mains, and appurtenant work. Pipe, fittings, hydrants, etc., furnished by Owner.

Drawings and contract documents may be examined and obtained at above office and office of Metcalf & Eddy, Engineers, 1300 Statler Bldg., Boston, Mass.; $10 deposit.

Bid security $6,000 certified check or bid bond. Successful bidder must furnish 100% performance bond.

BOARD OF WATER COMMISSIONERS
BRISTOL, CONNECTICUT

Bids: April 10, 1953

Water Distribution System—Installetion Bid

"Sealed proposals will be received by the South Adams County Water and Sanitation District, Board of Directors, at 8:00 P.M., Mountain Time, April 10, 1953 at a location to be announced later.

Work will include the installation of pipe and fittings furnished by the owner for approximately 42,000 ft. of 8"; 136,000 ft. of 6" and; 102,000 ft. of 4" pipe. Pipe will be either mechanical joint C.I. or Transite, choice to be announced later.

Plans and Specifications will be ready approximately March 17, 1953 and can be obtained from the Consulting Engineer, Ripple and Howe, 833 Twenty-Third Street, Denver, Colorado on payment of $25.00 deposit.

E. C. Francon,
Secretary"

UNUSUAL
OPPORTUNITIES
can be found each month
in the
SEARCHLIGHT SECTION

OFFICIAL PROPOSALS

Bids: March 23, 1953

Notice of Re-Advertisement

WEST VIRGINIA TURNPIKE COMMISSION
ADVERTISEMENT FOR PROPOSALS

Sealed proposals will be received by the West Virgina Turnpike Commission for:
CONTRACT NO. 23B

The work to be done under Contract 23B consists in performing the required grading and drainage for approximately 4.3 miles of the West Virginia Turnpike including the substructures for bridges. This work is located between Piney Creek, mile 32, and Little Whitestick Creek, mile 36, Raleigh County, West Virginia, and is in connection with the construction of the West Virginia Turnpike in the State of West Virginia.

The Principal items of work include:

	Approximate Quantity
Clearing and Grubbing	86 Acres
Excavation (all types)	1,132,000 Cu. Yd.
Embankment	1,093,000 Cu. Yd.
Concrete	4,850 Cu. Yd.
Reinforcing Steel	360,800 Lbs.
Culvert Pipes and Underdrains	11,000 Lin. Ft.
Steel Piles	576 Lin. Ft.

Proposals will be received at the office of the West Virginia Turnpike Commission, 1340 Wilson Street, Charleston 5, West Virginia until 9:00 A.M. Eastern Standard Time, and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia until 10:00 A.M. Eastern Standard Time, on March 23, 1953, at which time and place said proposals will be publicly opened and read.

Contract documents may be seen and may be inspected by prospective bidders during office hours at the office of Howard, Needles, Tammen & Bergendoff, 804 Greenbrier Street, Charleston, West Virginia, and at the offices of the Engineers, Fay, Spofford & Thorndike, 11 Beacon Street, Boston 8, Mass., and 305 Reservoir Road, Beckley, West Virginia.

Contract plans and specifications will be furnished for Thirty-Five Dollars ($35.00) for each complete set, which is not refundable, upon application to Howard, Needles, Tammen & Bergendoff, 804 Greenbrier Street, Charleston, West Virginia. Cross Sections are bound separately and will be furnished for Ninety Dollars ($90.00) for each complete set, which is not refundable. Partial sets can be furnished at cost upon application. Make checks payable to Howard, Needles, Tammen & Bergendoff.

Proposals must be made upon the proposal forms furnished by the Commission in the manner designated in the Specifications, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and the number of the contract on the outside, and must be accompanied by a CASHIER'S or CERTIFIED CHECK or PROPOSAL BOND in favor of the West Virginia Turnpike Commission FOR AN AMOUNT EQUAL TO FIVE (5) PER CENT OF THE AMOUNT OF THE PROPOSAL, but not less than $500.00 nor more than $200,000.00 and must be delivered at the place designated above on or before the day and hour named. Copies of the proposal form and proposal bond form to be used for submitting proposals, and of the special addressed envelope are furnished in detached form with the contract documents.

The contract will be awarded or the proposals rejected within thirty (30) days from the date of opening proposals. The right is reserved to reject any or all proposals, and to waive any or all formalities.

WEST VIRGINIA TURNPIKE COMMISSION
D. Holmes Morton
Chairman

February 27, 1953

Bids: March 24, 1953

Route S-28 (1927)—Rt. 18 (1953), Sec. 4-A

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Route S-28 (1927), Section 4A, Route 18 (1953), from Commerce Square to Bishop Street, Demolition of Buildings, in the City of New Brunswick, Middlesex County. Length 0.531 mile. The principal items of work are:

Estimated: Demolition of 119 Buildings
8,000 cu. yds. of Borrow Excavation

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, March 24, 1953, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N.J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N.J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: March 30, 1953

Additions to Sewage Treatment Plant

Sealed proposals will be received by the Borough of Waynesburg, Greene County, Pennsylvania, until 8:00 o'clock P.M. (Eastern Standard Time) on March 30, 1953, at which time and place the bids will be publicly opened and read aloud, for the Construction of Additions to Primary Sewage Treatment Plant and Miscellaneous Appurtenances. The work will be divided into four contracts and separate proposals will be received for each of the following contracts:

Contract No. 1—General Construction of Additions to Primary Sewage Treatment Plant, including mechanical work.
Contract No. 2—Plumbing for Additions to Primary Sewage Treatment Plant.
Contract No. 3—Heating for Additions to Primary Sewage Treatment Plant.
Contract No. 4—Electrical Work for Additions to Primary Sewage Treatment Plant.

Copies of the Plans, Specifications, Proposal Forms, and other Contract Documents may be examined at the office of William E. Sees, Jr., Consulting Engineer, 222 North Third Street, Harrisburg, Pennsylvania or at the office of the Secretary of the Borough of Waynesburg, Pennsylvania. A complete set of bidding documents, may be obtained at the office of the Engineer upon a deposit of $30.00 for each set of documents. If the documents are returned in good condition within five (5) days after the opening of the bids, $15.00 of the deposit for one set will be refunded. If the documents are not returned within the time stated, the entire amount of the deposit will be forfeited. A certified check equal to five percent (5%) of this amount of the bid must be submitted with the proposal as bid security. Separate checks must be submitted for plans and specifications for each contract.

No bid may be withdrawn for forty-five (45) days after the scheduled time for receipt of bids.

The Borough of Waynesburg reserves the right to waive any informalities in or reject any or all bids.

K. W. Scott, Secretary
Borough of Waynesburg
Greene County, Pennsylvania

OFFICIAL PROPOSALS

Bids: March 25, 1953

NOTICE TO CONTRACTORS
FEDERAL AID PROJECT NO. U.-208(6) & (7)
ETOWAH COUNTY, ALABAMA

Sealed bids will be received by the State Highway Director at the City Hall in Gadsden, Alabama, until 10:00 o'clock A.M., March 27, 1953, and at that time publicly opened for constructing a Bridge over the Coosa River in Gadsden, Alabama.

The entire project shall be completed in three hundred (300) working days.

The major items of work are approximately as follows:

4,789 Cu. Yds. Bridge Concrete
12,732 Lin. Ft. Steel Piling (10" B.P. @ 42#)
730,296 Pounds Steel Reinforcement
1 Lump Steel Superstructure (Approximately 1,726,666#)
100,950 Cu. Yds. Borrow (In Place) (For fill at Bridge Ends)

Certified check or Bid Bond for ten thousand dollars ($10,000.00) made payable to the Alabama State Highway Department must accompany each bid as evidence of good faith.

The minimum wage paid to all Skilled, Intermediate and Unskilled labor employed on this contract shall be as set forth in Special Provisions.

The proposed work shall be performed in conformity with the rules and regulations for carrying out the Federal Highway Act. Plans and Specifications are on file in the office of the State Highway Department at Montgomery 4, Alabama.

Plans, proposals and specifications may be obtained only upon payment of a deposit of ten dollars ($10.00) made payable to the Alabama State Highway Department. In accordance with Section 12 of Act No. 492 of 1947 Legislature of Alabama, proposals will be issued only to qualified contractors or their authorized representatives, upon requests that are received before ten o'clock A.M., on the day previous to the day of opening of bids.

Prequalification required. Alabama law requires that all bidders be qualified with State Highway Department; contractors desiring forms for prequalification should write W. G. Pruett, Director, State Highway Department, Montgomery, Alabama, immediately.

The right to reject any or all bids is reserved.

W. G. PRUETT,
Highway Director

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3897) will be received at Loveland, Colorado, until March 24, 1953, for furnishing labor and materials for earthwork, structures, and surfacing, Pole Hill access road, Flatiron Section, Estes Park-Foothills Power Aqueduct, Colorado-Big Thompson Project, Colorado. Location: Approximately 9 miles west of Loveland, Colorado. Principal items are: 28,500 cu. yds. of excavation; furnishing and laying 420 ft. of 24" to 66" corrugated metal pipe; 170 cu. yds. of concrete; furnishing and constructing 2 miles of right-of-way fences; and other work. Completion time 180 days. For particulars, address Bureau of Reclamation, Loveland, Colorado; or Building 53, Denver Federal Center, Denver, Colorado.

FRED G. AANDAHL
Assistant Secretary for Water and Power Development Department of the Interior

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UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC3904) will be received by Bureau of Reclamation, Denver, Colorado, until April 14, 1953, and then publicly opened for furnishing and installing four 30,000-kva, 95-percent power factor, 163.6-rpm, 11,500-volt, 3-phase, 60-cycle, vertical-shaft, alternating current generators complete with protective equipment assemblies, for Palisades Power Plant. The Palisades Dam and Power Plant will be located on the South Fork of the Snake River, approximately 7 miles southeast of Irwin, Idaho. Time allowed for completion will be 1,360, 1,450, 1,540, and 1,630 days for the four generators, respectively. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

FRED G. AANDAHL, Assistant Secretary for Water and Power Development Department of the Interior

OFFICIAL PROPOSALS

Bids: April 1, 1953

Contract C-8, Contract C-9, and Contract C-8 & C-9

NOTICE TO BIDDERS

Sealed proposals will be received by the Ohio Turnpike Commission for the performance of Contract C-8, Contract C-9 and Contract C-8 & 9, which last contract is a combination of Contract C-8 and Contract C-9 in one single contract.

The work covered by Contract C-8 consists generally of the construction of grading, drainage, and structures, and paving of approximately 4.69 miles in Construction Section 8 of the Ohio Turnpike, beginning at a point about 1.75 miles northeast of Newton Falls near the Ravenna-Warren Road at Turnpike Centerline Station 215+00 in Trumbull County, and extending in a northwesterly direction along the route of the Turnpike to a point about 0.65 miles west of the Trumbull County line at Turnpike Centerline Station 1042+66 in Portage County, and the construction of engineer's office buildings and facilities.

The work covered by Contract C-9 consists generally of the construction of grading, drainage, structures, and paving of approximately 4.61 miles in Construction Section 9 of the Ohio Turnpike, beginning at a point about 0.65 miles west of the Trumbull County line at Turnpike Centerline Station 1043+11.65 in Portage County, said point being the same point as Turnpike Centerline Station 1042+66 at the westerly end of Construction Section 8, and extending in a westerly direction along the route of the Turnpike to a point about 5.25 miles west of the Trumbull County line at Turnpike Centerline Station 799+78 in Portage County.

The work covered by Contract C-8 & 9 is the construction as above generally described for both Contract C-8 and Contract C-9.

The principal structures to be built in Construction Section 8 are one reinforced concrete box culvert, and eleven continuous span steel beam highway bridges of three and four spans each, supported on reinforced concrete abutments and bents. The abutments of eight of the bridges are to be on steel piles, the abutments of two of the bridges are to be on concrete piles and the abutments of one bridge are to be on rock. The bents of five bridges are to be on steel piles, the bents of four bridges are to be on spread footings, and the bents of two bridges are to be on concrete piles.

The principal structures to be built in Construction Section 9 are one reinforced concrete box culvert, and five continuous span steel beam highway bridges of three and four spans each, supported on reinforced concrete abutments and bents. The abutments of one bridge are to be on rock. The abutments of four of the bridges are to be on steel piles. The bents of three bridges are to be on spread footings and the bents of two bridges are to be on steel piles.

Approximate quantities of the major items of construction for Contract C-8 are as follows:

Roadway Excavation	655,000 cu. yds.
Borrow	1,937,000 cu. yds.
Structural Concrete	12,000 cu.yds.
Reinforcing Steel	1,763,000 lbs.
Fabricated Structural Steel	2,968,000 lbs.
Concrete Piling	28,000 lin. ft.
Steel Piling	25,000 lin. ft.
10" Reinforced Concrete Pavement	149,000 sq. yds.
Culvert Pipes and Underdrains	22,000 lin. ft.

Approximate quantities of the major items of construction for Contract C-9 are as follows:

Roadway Excavation	1,024,000 cu. yds.
Borrow	129,000 cu. yds.
Structural Concrete	6,200 cu. yds.
Reinforcing Steel	674,000 lbs.
Fabricated Structural Steel	902,000 lbs.
Steel Piling	7,000 lin. ft.
10" Reinforced Concrete Pavement	125,000 sq. ft.
Culvert Pipes and Underdrains	26,000 lin. ft.

Copies of Plans and General Specifications for said Contracts are immediately available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 361 East Broad Street, Columbus 15, Ohio. These documents may be purchased from said Chief Engineer for the following sums per set, which sums are non-returnable:

General Specifications for Ohio Turnpike Project No. 1	$ 5.00
Plans, including soil profile and boring logs and other Contract Documents (excluding General Specifications) per set per Section	$15.00
Cross Sections per set per Section	$25.00

Forms or copies of Proposals for each of Contracts C-8 & 9, C-8 and C-9; of the Affidavit which must accompany any such proposal; of this Notice to Bidders; of the Special Provisions applying to said contracts; of the Contract to be entered into with the (or each) successful bidder; and of the Contract Bond to be furnished with such contract will be furnished upon request and without charge to any interested person at aforesaid Chief Engineer's office on and after March 16, 1953. One set (or, if requested, a reasonable additional number) of said documents wil be furnished without charge to each purchaser of either of the aforesaid sets of plans.

All proposals must be on forms prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Each proposal must be accompanied by a certified check on a solvent bank, payable to the order of the Ohio Turnpike Commission, in an amount not less than 5% of the total amount bid. If a bidder bids on Contract C-8 & 9 and also on either or both of Contracts C-8 and C-9, one certified check will suffice, if in an amount not less than 5% of the total amount bid by him on Contract C-8 and 9. If a bidder bids on both of Contracts C-8 and C-9, but not on Contract C-8 & 9, he shall submit separate certified checks with each bid. The Commission may at any time cash any such check. Each such check, or the proceeds thereof, will be held by the Commission as a guaranty that, if any proposal guaranteed thereby is accepted, a contract will be entered into and the performance of the proposal secured. Each such check, or the proceeds thereof, will be returned or forfeited as provided in paragraphs G-3.03 and G-3.06 of the aforesaid General Specifications; provided that if there be a forfeiture, it shall be of an amount equal to 5% of the total amount bid in the proposal with respect to which the forfeiture occurs, and any excess thereover will be returned to the bidder.

All bids must be received at or before 10:00 A.M., Eastern Standard Time, April 1, 1953, in the offices of the Ohio Turnpike Commission, 361 East Broad Street, Columbus 15, Ohio. At said hour, the bid box will be removed to Neil House Hotel, 41 South High Street, Columbus, Ohio, where all proposals will be publicly opened and read.

If the bid of the lowest and best bidder for Contract C-8 & 9 is lower and better than the bids, taken together, of the lowest and best bidders for Contracts C-8 and C-9, respectively, Contract C-8 & 9 will be awarded (if any award be made) to said lowest and best bidder for it, and no award will be made of Contracts C-8 and C-9. If the converse be true, no award will be made of Contract C-8 & 9 and, if awarded, Contracts C-8 and C-9 will be awarded to the lowest and best bidders for them, respectively. Since the Commission reserves the right to reject any or all proposals, it may award either Contract C-8 or Contract C-9 to the lowest and best bidder therefor, and make no other award, or it may make no award of any of the contracts. To qualify for award, a bidder's proposal must comply with the prescribed requirements.

The Commission reserves the right to waive technicalities.

OHIO TURNPIKE COMMISSION
DATED March 2, 1953

Bids: March 24, 1953

Rt. 46 (1953), Sec. 1, L. & N. E. R.R. Bridge #63.79

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commisioner for:

Construction of Lehigh & New England R. R. Bridge #63.79, Route 46 (1953), Section 1, Columbia Township, Warren County. The principal items of construction are:

Estimated:

320 cu. yds. Class "B" Conc. in Structures
31,000 lbs. Reinforcement Steel in Structures
117,000 lbs. Structural Steel
750 lin. ft. Steel Piles

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, March 24, 1953, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: April 2, 1953

Lincoln Tunnel Third Tube

THE PORT OF NEW YORK AUTHORITY
EXCAVATION FOR NEW JERSEY SHAFT AND CONSTRUCTION OF CRANE BRIDGE AND CRANE

CONTRACT LT-160.038

Sealed proposals for the excavation for the New Jersey Shaft and for the construction of a crane bridge and crane for the Third Tube of the Lincoln Tunnel will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y. until 2:30 P.M. on THURSDAY, April 2, 1953, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1110, and copies will be furnished upon deposit of $50.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, March 12, 1953

CONTRACTORS WATCH THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

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Openings in Cleveland and other various offices offering good salaries with long term employment opportunities for qualified personnel in the following categories

Structural—Engineers and designers experienced in structural steel and reinforced concrete design on industrial and commercial buildings

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Specifications—Specifications writers experienced in writing specifications for industrial and commercial buildings

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These positions offer excellent working conditions with paid vacations, sick leave and participating group insurance program.

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P-7149, Engineering News-Record
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P-7129, Engineering News-Record
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WANTED
ENGINEER-MANAGER

To supervise construction of and operation of Incinerator and Water Distribution Authorities for a metropolitan area of 200,000 population. Administrative, engineering, construction, and operational experience desired. Applications close April 1, 1953. Salary open. For job specifications write:

DONALD M. OAKES
3226 Coolidge Highway, Berkeley, Mich.

STRUCTURAL STEEL SALES ENGINEER

Exceptional opportunity for a thoroughly experienced structural engineer who can estimate & sell structural steel for all types of buildings, fabricated & erected.

Plant is long established, has large capacity, located in metro N. Y. area. State experience & salary for personal interview at our expense.

SW-6708, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

Help Wanted Male
STRUCTURAL STEEL DRAFTSMAN, DETAILER, AND CHECKER
Experienced, First-Class, Civil Engineer Graduate preferred, permanent position, top rate.
P. O. BOX 955
NEW HAVEN, CONNECTICUT

PROJECT MANAGER

Must be thoroughly experienced in steel and concrete construction, engineering background advantageous. Splendid opportunity. Commensurate salary. Job duration about one year. Pittsburgh, Pennsylvania area. Advise qualifications and availability.

P-7023, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED
SUPERINTENDENT
California firm seeks experienced construction superintendent for industrial and refinery projects with specialization in industrial, process and power piping; millwrighting and machinery installation work. Give full experience record, education, age, availability and salary expected.

P-7013, Engineering News-Record
1111 Wilshire Blvd., Los Angeles 17, Calif.

BRIDGE DESIGNERS

Private Consultants require experienced men for work this area. Send experience resume to

P. O. Box 752 Providence, R. I.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

FELLOWSHIP

OCEANOGRAPHY: UNITED Gas Fellowship in Engineering Oceanography — $3000 — To be awarded to highly qualified graduate research engineer with broad scientific interests. Write: Head, Department of Oceanography A. & M. College of Texas, College Station, Texas.

POSITIONS VACANT

ENGINEER WITH training in soils mechanics and experience in materials selection and embankment control for resident supervision of Construction on waterworks project in Ohio. Opportunity for permanent connection. Please state qualifications and salary requirement and give references. P-7008, Engineering News-Record.

ENGINEERS-SURVEYORS: Party Chiefs, Instrumentmen, Rodman and Chairman for work in the Southern California Area on Subdivision and Heavy Construction. Good pay and conditions. Contact James J. Twombley, International Union of Operating Engineers, Local Union No. 12, 2323 West Eighth Street, Los Angeles, California. Phone: DUnkirk 8-3361.

ENGINEER OR Draftsman, civil or mechanical (piping), experienced in construction work, field or office. Write P. O. Box 126, Wilmington, Delaware.

FLA. REGISTERED structural engineer to share offices with architectural designer. Rent in exchange for small services. Write direct to Harris, 1640 N.W. 19th Ave., Miami 35, Fla. Phone 2-11-38.

EXPERIENCED DETAILERS needed for permanent positions with largest independent in Southern California. Excellent employment conditions and opportunities. Write for details giving employment history. Union Steel Company, 7301 Telegraph Road, Los Angeles 22, California.

EXPERIENCED STRUCTURAL estimator who wishes to live in California and work for the future with young aggressive company. Shop force approximately 500 men. Year round work in fields of Steel Buildings, Bridges, Tanks and Steel Frame Housing. Only qualified men with ambition needed. Write for details giving employment history. Union Steel Company, 7301 Telegraph Road, Los Angeles 22, California.

ENGINEER, CIVIL or mechanical, to assist plant manager of concrete products plant in New Jersey. Write education, experience (if any), age and salary expected. Position Permanent with steady advancement. P-7142, Engineering News-Record.

ESTIMATOR ON building construction for long established firm. Our organization aware of this ad. Replies held in confidence. Write care of P. O. Box 26, Everett, Mass. State experience and salary requisites.

SELLING OPPORTUNITY OFFERED

SALESMAN WANTED in Upper Peninsula of Michigan. Experience preferred in earthmoving and construction equipment sales. Send all particulars and qualifications, photograph optional. Brebner Machinery Co., Inc., Marquette, Michigan.

EMPLOYMENT SERVICE

WANTED-ENGINEERS, Designers, Draftsmen-Structural, Piping, M.E., C.E., E.E. and Industrial, also Teaching and Chemists, Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

CIVIL ENGINEER, graduate, age 31 with 10 years of experience including cost engineering, inspection work, sewer and water line construction, and engineering administrative work. Minimum salary requirements $48.00. Will relocate. PW-6972, Engineering News-Record.

BUILDING ESTIMATOR, 20 years experience in all phases of general contract field. Qualified in handling estimating, bidding, subcontracting, purchasing, and office co-ordination desires permanent contact in Palm Beach, Ft. Lauderdale, or Miami Florida area. PW-7053, Engineering News-Record.

HIGHLY QUALIFIED appraisal engineer with ample and intensive experience on public utilities, etc.; also strong attractive personality; ability to handle discussions with bankers and to conduct negotiations with clients of a large engineering company. PW-7044, Engineering News-Record.

CIVIL-STRUCTURAL Engineer: 20 years. Municipal, industrial, commercial buildings; highways, bridges, special structures. Planning, supervision of design and construction, public relations and promotion. Engineering organization manager for 8 years. PW-6851, Engineering News-Record.

SUPERINTENDENTS AND PROJECT MANAGERS TRAINING COURSE

All instructions by mail. Send today for sample lesson and complete details

GEO. E. DEATHERAGE & SON
411 S. 5th Ave. Lake Worth, Florida

ENGINEER

PROJECT - COORDINATING - LIAISON

Mech. Engr, 34, Experience Industrial Buildings, Power Plants, and Projects. Can handle complete assignment from initial to final stages. Supervision of Contractors and Subs for all mechanical and Building Trades. Preparation of reports, etc. Will Relocate.

PW-7114, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

AVAILABLE

General Superintendent or Project Manager—long successful record in direct charge of major construction projects. Will accept either domestic or foreign assignment. Knowledge of French, German & Spanish. Experience covers Waterfront, Building, Highway, & Bridge Construction, Sewage and Water Treatment Plants, Power Plants.

PW-6703, Engineering News-Record
330 West 42nd St., New York 36, N. Y.

POSITIONS WANTED

ENGINEERING EXECUTIVE, North American, graduate U. S. Naval Academy (Annapolis) 1935. PG at MIT; extended experience in management, mechanical and electrical design, sales engineering, residential design, and construction. Six years in Venezuela; speaks Spanish fluently. Age 39, married with three children. Position in South America preferred but interested in all. PW-6681, Engineering News-Record.

ENGINEERING MANAGER background in complete Plant Design, preparation and analysis of budgets for industrial installations. Bulk of experience in detergents. Pharmaceuticals and organic chemicals. PW-6457, Engineering News-Record.

SANITARY ENGINEERING Designer, extensive experience treatment plant design including 7 years overseas. Available, now prefer U. S. Location. PW-6916, Engineering News-Record.

EXECUTIVE ENG'N-Supt. Formerly qualified journeyman. Five trades. Aggressive, ample know-how and expert improvising in field. Will assume responsibility for layout selecting equipment and production. Cost conscious. Review plans, prepare schedules industrial construction, schools, hospitals, housings, military installations. Maintain client and labor relations. Licensed Engineer New York. Now available. PW-6488, Engineering News-Record.

STRUCTURAL ENGINEER, age 50, thorough supervisory experience with large consulting and construction organizations on power plants, chemical plants, large industrials, airfields, waterfront structures, dams, bridges, etc. Excellent estimator, spec writer. Desires permanent responsible position. Salary range $8,000 to $10,000. PW-6971, Engineering News-Record.

SUPERINTENDENT OR Assistant to General Superintendent. 20 years heavy construction. Excavation, drainage and paving. Know men, methods, equipment and cost. Available April 1st. PW-6973, Engineering News-Record.

SUPERINTENDENT. 25 years construction experience, bridges, dams, treatment plants, pumping stations, concrete structures, sewer and water systems, heavy excavation, water front work, etc. Just off eleven million dollar warehouse job. Good organizer, know men and equipment. Familiar with labor and material costs and distribution. References upon request. Any location. Available immediately. PW-7022, Engineering News-Record.

ESTIMATOR-CONTRACT Administrator-grad, C.E. Six years experience structural design; Field; Office; industrial; commercial; public buildings seeks employment with growing progressive general contractor. Prefer vicinity N.Y.C. but will relocate for right job. Single, veteran. PW-7148, Engineering News-Record.

GENERAL SUPERINTENDENT, broad experience as industrial and public works construction including, sewage and water plants, bridges, waterfront structures, schools, commercial buildings, etc. Competent estimator. Civil engineering education. PW-7146, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT, Concrete pipe manufacturer, considerable experience. PW-7090, Engineering News-Record.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-third year. Write today.
WILSON Engineering Corp.
College House Offices - HARVARD SQUARE, CAMBRIDGE, MASS.

POSITIONS WANTED

CONSTRUCTION SUPERINTENDENT & Engineer, with 30 years experience in estimating, bidding and planning and supervising of construction in Earth Work, highways, airport, levees and ditches—In concrete, bridges, paving industrial buildings, tilt-up and some in dams & tunnels—In subterranian work, pile driving bridge foundations, large sewers and pumping plants. Available soon. Contact Engineer, Tel. 5-3966 or 2301 61st St., Des Moines, Ia.

C.E. GRAD., Age 29, with 7 yrs. of varied field & office construction exp. Speaks Spanish. Desires position in the field, here or in South America. PW-7117, Engineering News-Record.

CONSTRUCTION ENGINEER, experienced as Project Manager and Construction Superintendent on large Hydro-Electric projects and Chemical, or Industrial Plants in U. S. or abroad. Capable of handling Labor Relations assignment on large projects. Twenty years experience on heavy construction including multiple purpose dams, harbors, and foundations. Specialist in concrete problems of all types. Available about April 15, 1953. Administrative ability above average. Presently completing large Industrial Plant. Seeking a change. PW-7134, Engineering News-Record.

CIVIL ENGINEER desires position with Consultant or Engineering Department. Degree, experienced construction, estimating, limited design. Age 31, Married. Prefer Midwest or Texas. PW-7113, Engineering News-Record.

CONSTRUCTION MANAGER or Project Engineer. Good record, charge of estimating, costs, purchasing, client relations, all types of construction-experience in government contracts—prefer West or Southwest. References. Salary $10,000 plus bonus. Desires permanent connection. Age 49. PW-7112, Engineering News-Record.

SUPERINTENDENT, 15 years Heavy Construction experience Bridges, Tunnel, Sewers, Shoring Foundations, Concrete, structural steel. Highest references. Available April 15th. West Coast preferred. PW-7069, Engineering News-Record.

CONSTRUCTION SUPT, capable of taking complete charge. 26 years experience in Industrial, Commercial, some Housing. Good organizer, time and cost conscious. Experience with Heat Resistance concrete in Jet Test Cells. Prefer South or Southwest. PW-7076, Engineering News-Record.

SUPERINTENDENT, 20 years experience in all phases of heavy construction, sewers, dams, bridges & Highways. Also coffer dams and tunnels. PW-7075, Engineering News-Record.

DRAFTSMAN AND Reinforcing bar detailer, 2 years experience, for contractor or engineering office. PW-7158, Engineering News-Record.

CONST. SUPT. Eng. knowledge, earthwork, highway, dams, thirty years experience, desires location in western states. PW-7164, Engineering News-Record.

FOR FOREIGN Employment—C.E. graduate with 6 yrs experience Steel & Concrete Design, 1 yr. Field, N.Y. P.E. PW-7154, Engineering News-Record.

DRAFTSMAN—GOOD freehand letterer. PW-7163, Engineering News-Record.

WORK WANTED

Licensed Surveyor with party available for preliminary and location surveys on Highways and Railroads. WW-7147, Engineering News-Record.

BUSINESS OPPORTUNITIES

Experienced Engineers, Designers or Contractors interested in associating actively and financially conducting business of well established Architects-Engineers Design Office located New York—Floating Equipment—Port Developments—Power Plants, etc. Reply with full details experience, references, etc. BO-7041, Engineering News-Record.

Sanitary Engineer, industrial background, wishes to purchase partnership in consulting engineering organization. BO-7096, Engineering News-Record.

WANTED

EXECUTIVE MECHANICAL ENGINEER

General Superintendent of Maintenance

Company operating several maintenance shops and large quantities of heavy construction equipment seeks the best qualified engineer to take the top responsibility for all maintenance costs.

Applicant must have proven executive ability, know machine shop practices, repairs and evaluation of heavy construction equipment and competence to control maintenance expenditure of approximately one million dollars annually.

Give detailed qualifications with last salary.

P-7151, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEERS

Structural, mechanical, and electrical for work on hydro-electric power developments. Write giving full experience record and qualifications.

HARZA ENGINEERING COMPANY
400 West Madison Street Chicago, Illinois

SPECIFICATION WRITERS and ESTIMATORS

Architectural and mechanical. Experience on industrial, commercial and institutional work desired. Give age, education, detailed experience record, references and salary expected.

P-6865, Engineering News-Record
330 W. 42nd Street, New York 36, N. Y.

WANTED:

Marine Construction Superintendent

Age 35 to 40, C.E. Degree, with at least ten years experience in heavy construction such as bridge foundations, breakwaters, piers and docks. Must have had considerable time in full charge of projects. Permanent position. Salary $6500 to $7500 with Life Insurance, Hospitalization and Retirement Benefits. Location Middle West.

P-6815, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED

General Asphalt Paving Superintendent

Excellent opportunity for experienced man in Asphalt Resurfacing and General Road Construction work.
Southern Connecticut Area. State Age and Qualifications. Reply to
P-6976, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED

An Alert Mechanical Engineer with Some Knowledge of Electrical Engineering . . . Must Be a Good Calculator . . .

PHILIPS & DAVIES, INC.
KENTON, OHIO

WANTED

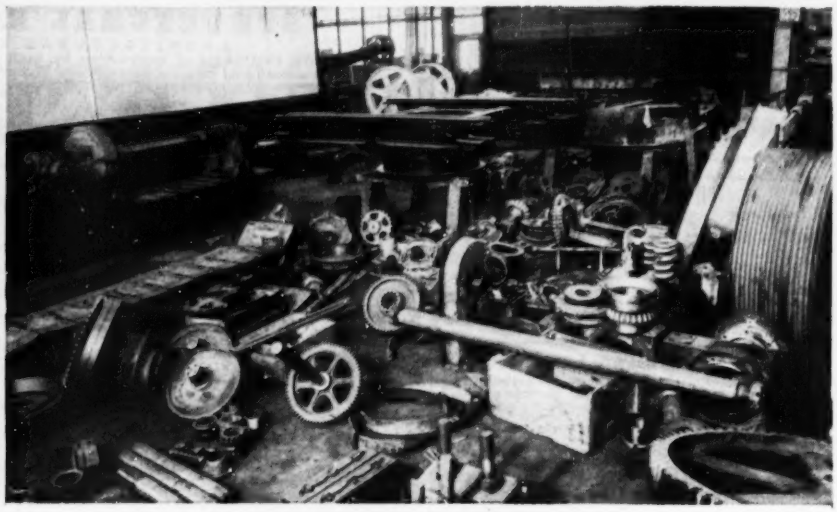
WORKING CAPITAL

Aggressive contractor with proven record desires to expand. Road and Bridge construction. Several contracts now under way. Will consider partner.

BO-7150, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

BEFORE

L. B. SMITH starts rebuilding used equipment, it is necessary to *completely* dismantle it . . . as was the case illustrated here. Skilled workers, manning the latest and most modern machines, using standard bushings, standard shafts, standard factory parts, perform our rebuilding jobs *with doctor-like thoroughness!*



THE REBUILDING JOB WE DID HERE...

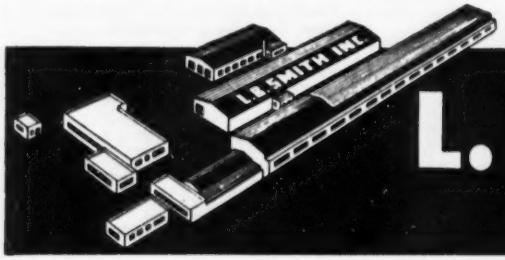
can be done on your equipment, too!!!

AFTER

L. B. SMITH rebuilds equipment, it is ready for many years of further use. Wherever possible, new design is incorporated into the rebuilt machine, increasing the productive capacity. And, since under- and oversizing shafts, bearings, etc. is frowned upon, no trouble is experienced in future maintenance.

Your Equipment???

Have you equipment we can rebuild?
You are invited to use our facilities — the world's largest equipment rebuilding facilities . . . where rebuilding is a business — with over 25 years of experience on all types of construction equipment — where trained mechanics with precision tools — can build back into your equipment many years of additional and efficient usefulness — using the same thoroughness employed in rebuilding our own used equipment. Write today



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CAMP HILL, SUBURB OF HARRISBURG, PA.

L. B. SMITH INC.

New and Used Equipment News

Prepared Monthly by Ed Woolford at Camp Hill, Pa.

VOL. 1 NO. 11

AIR COMPRESSORS

Gardner-Denver 500 cu. ft. diesel, new condition.
Gardner-Denver 500 cu. ft. diesel, good operating condition.
Worthington two-stage, water-cooled, vertical 250#, 60 CFM, new condition.
Paving breakers, jackhammers, wagon drills, tie tampers.

QUARRY EQUIPMENT & BINS

2540 Cedarapids AAAA primary unit on rubber, diesel power. Rebuilt.
2036 Cedarapids AAA primary unit on rubber, diesel power. Rebuilt.
1036/2418 Cedarapids Jr. Tandem unit on rubber.
Cedarapids Rock-It plant w/2025 jaw, 3033 hammermill. New.
1236 Cedarapids Model 6C plant. New.
4033 Cedarapids Model 6C plant. New.
2020 Cedarapids double impeller. New condition.
4024 Cedarapids roll. Rebuilt.
3018 Cedarapids roll. Rebuilt.
1236 Cedarapids twin jaw crusher. New.
1036 Cedarapids jaw. Rebuilt.
10x7 Allis Chalmers lake type jaw crusher. Rebuilt.
#1 Cedarapids Kubit impact breaker. New condition.
B-3 Jeffrey swing hammer pulverizer. Rebuilt.
42" x 10' Cedarapids feeder.
4' x 6' Kennedy Van Saun single deck screen.
3' x 6' Kennedy Van Saun triple deck screen.
60" dia. x 14' long Traylor revolving screen. Rebuilt.
36" Wemco single pitch sand screw. New condition.
15 cu. yd. Cedarapids sand drag. New.
16" x 90' bucket elevator.
60-ton, 2-compartment, 8' x 18' storage bin w/clam gates.
100-ton, 2 compartment, 13'x23' storage bin.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also belt.
24" Dia. x 36" face magnetic pulley.

TRUCKS—TRAILERS

27FD Euclid rear dumps.
1½-ton Ford with any body.
2000-gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.

GENERATORS & LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current gasoline and diesel powered.

SHOVELS—CRANES

Lorain L-82, 2-yd. diesel.
Lorain 77, 1½-yd. diesel.
Lorain 75B, 1¼-yd. diesel.
Lorain L-50-I, 1-yd. diesel.
Lorain 40 truck crane on Mack 3-axle truck.
Buckeye ¾-yd. diesel.
Unit 514, ½-yd. gasoline crawler shovel, rebuilt.
Lorain 30A, ½-yd. gas combination.

SHOVEL & CRANE ATTACHMENTS

Lorain L-41 Chain Crowd Shovel Attachment. Rebuilt.
Lorain 40 Hi-Lift shovel attachment.
P&H 203 shovel attachment.
Chain crowd Lorain 30A shovel attachment.
Bucyrus-Erie 1½-yd. rock bucket.
McCaffrey Model 648 for 1¼ to 2-yd. crane.
McCaffrey Model 636 for ¾-yd. to 1-yd. crane.
Lorain 77 crane boom, 45'.

BACKHOE BUCKETS & ATTACHMENTS

Lorain 30 hoe attachment complete.
¾-yd. Lorain, 40, LBS #6105, 44" cutting width.
¾-yd. Amsco 40" cutting width, LBS #8101.

CLAM—DRAG—SCRAPER BUCKETS

LIFTING MAGNETS

1—45" Ohio lifting magnet, rebuilt.

SHOVEL DIPPERS

Lorain 41, ¾-yd. LBS #8600, rebuilt.
New Lima 1-yd. Amsco, LBS #2295.
Bucyrus-Erie 1¼-yd. gas air, LBS #3782, fair.
Lorain 75B, 1½-yd. manganese bucket, LBS #8538.
Lorain 75B, 1¼-yd. extended lip, 1¾-yd. LBS #2250.
Pettibone-Mulliken 2-yd. Lorain 82 or 820, manganese, LBS #5361.
Pettibone-Mulliken 2-yd. for 3500 Manitowoc LBS #5763.
Esco 2½-yd. cast weld dipper with bail & teeth.

CONCRETE EQUIPMENT

Blaw-Knox gas-electric finisher, 10½'-12½', rebuilt.
Koehring 10'-12' finishers, rebuilt.
Cleveland formgrader, new 1944 rebuilt.
Corr formgrader, new 1944, rebuilt.

TRUCK MIXERS

3-yd. Smith high discharge mixer on International chassis.

TRACTORS

TD-24 International with Bucyrus-Erie angle-blade.
TD9 International diesel with 1 yd. Loadover.
Model CR Tournapull w/16-yd. Model E16 Tournarocker, rebuilt.

WELL DRILLS & TOOLS

Sanderson-Cyclone #42 well drill, new.
Sanderson-Cyclone #44 well drill, new.
Bits—Stems—Bailers—Sockets—Etc.

Barber-Greene 44C Trenching machine 18" to 24" cutting width, 7' depth.

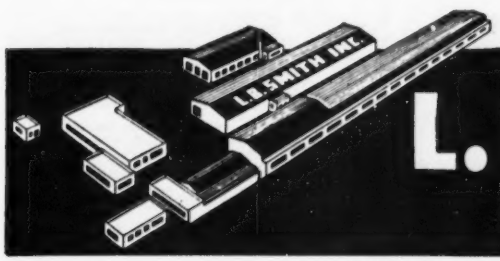
PUMPS

New Layne Bowler type 18 deep well pump with right angle gear drive, 3000 GPM at 120' TDH.
Used and rebuilt pumps, all sizes, gasoline, electric or diesel.

GASOLINE AND DIESEL ENGINES

Caterpillar D-13000, rebuilt.
Murphy ME-6, & ME-48, rebuilt.
Caterpillar D8800.

***Phone* HARRISBURG, PA. 7-3431**



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DIESEL POWER

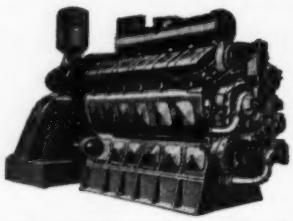
IMMEDIATE SHIPMENT

• PURCHASE OR RENTAL

UNIT CAPACITIES—10 TO 2475 KVA

A.C.—50 AND 60 CYCLES

• ALSO D.C. UNITS



A PARTIAL LISTING OF OUR INVENTORY

KW	Make	Model	HP	RPM	KW	Make	Model	HP	RPM
1980	Nordberg	TS-217	2800	225	320	Enterprise	DSG-6	560	450
1500	Fairbanks Morse	33E16	2000	300	300	General Motors	8-268A	450	1200
1136	Fairbanks Morse	38D	1600	720	250	Fairbanks Morse	37-E	375	360
1100	General Motors	16-278A	1600	720	200	General Motors	8-268A	350	900
750	General Motors	12-567	1080	720	150	Worthington	CC-4	225	450
500	Baldwin	VO-8	750	514	150	Buckeye	80	240	600
500	General Motors	8-278A	750	720	100	Worthington	BB-5	150	600
500	General Motors	8-567	720	720	100	General Motors	3-268A	150	1200
400	Ingersoll-Rand	8-8	600	720	60	General Motors	6-71	90	1200
350	Baldwin	VO-6	510	450	30	Internat'l Harvester	UD-14	45	1200

A. G. SCHOONMAKER COMPANY, INC.

ENGINE DIVISION, 50 CHURCH ST., NEW YORK 7, N. Y.

Koehring Shovel 1¼ Yd. Cat Diesel New 1951 $35,000.00

Marion Shovel ¾ Yard Crane & Backhoe G. M. Diesel extra large tracks new 1948.....$17,000.00

Lorain Shovel ¾ Yd. and Backhoe Cat Diesel new 1950 .....$17,000.00

Unit ½ Yard Crane new 1951.....$7,000.00

2—Unit ½ Yard Backhoes, Diesel.....$8,500.00

H. D. 20 with Pusher block 17 Yard La Plante Choate wagon, Used 400 hrs.....$28,000.00

H. D. 19, new motor, new tracks, angleblade $10,000.00

3 Garwood Carryalls 11 Yards.....$3,500.00

H. D. 9 Angleblade. Used 4 months.....$9,000.00

H. D. 5, new 1952 new motor.....$6,500.00

5 H. D. 14 Bulldozers with blades $3,500.00 to $6,500.00

Cat D. 6 Angleblade new 1951.....$7,500.00

Grader Cat #12.....$7,500.00

Hough Loader 1½ Yd. 4 wheel drive.....$6,500.00

3 Terra Corbras, new motors.....$6,500.00

Griffin Well Point System

Also Trucks—Rooter—Sheep Foot Roller—Concrete Mixer—Fordson Tractor—Gallon Roller

Contractor Disposing Surplus Equipment

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COMPLETE TUNNEL EQUIPMENT

For Drilling

3—1035 c.f.m. Ingersoll-Rand Stationary Compressors with 200 H.P. Electric Motors, Air Receivers, Aftercoolers and made-up piping.
10—Ingersoll-Rand No. 229 DJB Drill Booms
16—Ingersoll-Rand DA35, wet type Drifters

For Mucking

3—#40 Eimco Rockershovels
4—#75 Conway Muckers

For Hauling
(all 36" gauge)

6—Greensburg, 11 ton, Electric Locomotives
3—Whitcomb, 10 ton, Electric Locomotives
3—40 K.W. Battery Charging Units
2—20 K.W. Battery Charging Units
1—Plymouth, 10 ton, Gas Locomotive
8—5 yard Side Dump Muck Cars
6—2 yard Koppel Dump Cars
30—Flat Cars

For Ventilation

2—7300 c.f.m. Roots-Connersville Blowers
1—Joy Axivane Fan, series 1000
12,000'—24" Vent Pipe, Lock Joint, 14 gauge

For Concreting

2—¾ yard Hackley Pneumatic Concrete Placers
1—Model 190 Rex Pumpcrete Machine
Special Placing Equipment for Arch and Invert

Miscellaneous

25—1½" to 4" Electric Pumps
2—60 K.W. Diesel Generator Sets

Subject to prior sale

FRAZIER-DAVIS CONSTRUCTION COMPANY

1319 Macklind Avenue, St. Louis, Mo. **STerling1950**

Box 153—Grahamsville, New York **Grahamsville 2861**

FOR SALE

65 ton G.E. Diesel Elec. Locomotive.
50 ton Colby 240 Elec. Gantry Crane.
1½ yd. Koehring 605 Diesel Crane 140' Bm.
30 ton Ind. Brownhoist Gas Loco. Crane.
½ yd. Link-Belt LS-50 Shovel-Backhoe-Crane.
10 ton Unit 1020 Pneu. Tired Crane.
25 ton Wiley Steel Stiffleg. 110' Bm.
130 HP Christian 2D Diesel Hoist.
1035 CFM I.R. Air Comprs. New 1949.

MISSISSIPPI VALLEY EQUIPMENT CO.

509 Locust St. **St. Louis 1, Mo.**

1—20-ton Lorain MC 414 Truck Crane
1—20-ton Bay City 180 Truck Crane
1—¾ Yd. Bay City Diesel Crawler Crane
4—500 cu. ft. Chi-Pneu. Diesel Air Compressors
1—45-ton G.E. Diesel Elec. Locomotive
1—50-ton Whitcomb Diesel Elec. Locomotive
1—65-ton G.E. Diesel Elec. Locomotive

B. M. WEISS COMPANY

Girard Trust Company Bldg. **Philadelphia 2, Pa.**

Get a **COMPRESSOR**

TELEPHONE Union 5-4848

STATIONARY-PORTABLE FROM COMPRESSOR MEN

- **ELECTRIC**
- **STEAM**
- **GAS - WORTHINGTON - IR**
- **DIESEL - IR - WORTHINGTON**

50 YEARS OF SERVICE

20 Lbs to 3000 Lbs
30 CFM to 2500 CFM

RENTAL
RENTAL PURCHASE

AMERICAN AIR COMPRESSOR CORPORATION

DELL AVE. & 48th ST. NORTH BERGEN, N. J.

LOCOMOTIVES

2—Baldwin 100 Ton Diesel.
1—Brookville 14 Ton Diesel Std. Ga.
1—Brookville 10T-30" Ga. Diesel—Like New.
2—Plymouth 8 Ton Gas. Std. Ga.
1—Vulcan 14 Ton—30" Ga., Diesel.
3—Whitcomb—15 Ton—36" Ga.—Diesel.
Whitcomb 30 Ton Std. Ga. Diesel.

1—WHITCOMB-0-4-0-STD. GA, 50 TON DIESEL ELEC.—BARGAIN

1—Lima 1201 Shovel—New 1950.
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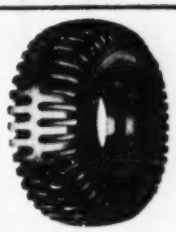

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16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
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30"	6	1/8"	1/16"	32 Oz.
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Gradall has heavy undercarriage and remote control

Balanced carrier has shorter wheelbase for easier maneuverability and operator can relocate truck unit remotely

Warner & Swasey's multi-purpose earthmoving and construction machine, the Gradall, is now available with a new undercarriage designed for better operating efficiency of the unit as a whole. Available as an optional extra is a remote control carrier drive system making one-man operation possible.

• **Undercarriage**—The new carrier is so balanced that it's said to be tip-proof and thus needs no outriggers. The wheelbase is 18% shorter, down to 162 in., which increases maneuverability and keeps overall frame length down to 244¼ in. With a chassis weight of 12,550 lb., the carrier is the heaviest to date on a Gradall mounting. Gross vehicle weight is 40,000 lb.

The engine used in the undercarriage is a 427-cu-in. L-head unit that develops 140 hp at 2,800 rpm. An oversize radiator insures ample cooling even when idling at high ambient temperatures. Design includes a 13-in. vibration-dampened clutch, Timken axles and Bendix-Westinghouse air brakes. An optional model is the 6x6, with front driving axle.

• **Remote control**—By means of pushbuttons in the operator's cab (photo, upper right) the operator can actuate a pneumatic-electrical control system to direct operations of the carrier. The motor can be started and stopped, the unit driven forward or backward and wheels steered right or left—all with pushbuttons. Thus the operator may spot the unit as often as necessary while work progresses without the need for shouting, signaling or tying up the time of a guide man. GRADALL DIV., WARNER & SWASEY CO., 5701 CARNEGIE AVE., CLEVELAND 3, OHIO.

Electronic nose finds leaks in pipes, tanks

A nearly fool-proof method in finding leaks in anything from a football to a complicated coil of pipe or a huge distillation tank has been developed with a gas that once served only as the cold-making agent in refrigerators.

The test medium is duPont's Freon-12, a fluorinated hydrocarbon which, under pressure, is a colorless, virtually non-toxic and odorless liquid that changes to gas when released from pressure at room temperature.

The first electronic detector that is responsive to Freon-12 was developed by General Electric and is said to be so sensitive that it can uncover a leak that would let only 1/100 oz of Freon escape in a year's time.

One important use of the Freon detector is in the testing of pipe coils and pressure vessels too large to be filled with compressed air and dunked in a liquid bath. Today precision manufacturers such as Foster Wheeler Corp. of Carteret, N. J., carry out tests on tanks two stories high by filling them with a mixture of Freon and air and then using electronic noses to inspect likely leak points.

With the increasing use of radiant heating systems in home and industry, the small Freon electric detector is finding its way into the tool box of heating contractors. E. I. DU PONT DE NEMOURS & CO., WILMINGTON, DEL.

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*Based on total tire capacity (not net weight)

DART

60 TON MODEL 60

Model 60 SPECIFICATIONS

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This is the truck which will influence truck design for years to come . . . the 60 ton DART.

Anticipating that the industry has reached its limit in the "scaling-up" of conventional design, the DART TRUCK COMPANY conceived and built the Model 60. It is an innovation in truck design—a combination of advanced engineering and time-proved features. As the star performer in DART's 50th Anniversary Year, it is proof again that to carry more per load for less cost—you can rely on DART.

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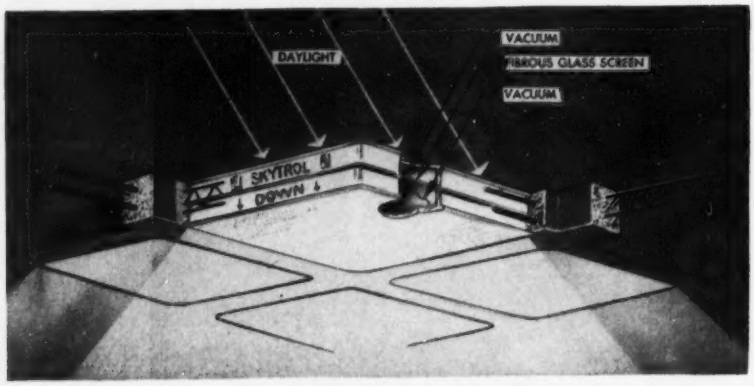

CUTAWAY VIEW shows how fibrous glass screen divides new skylight blocks into two partially-vacuumed cavities. These and internal prisms counter heat gain and loss, glare and condensation, common to most blocks.

Glass block designed structurally and optically for use in skylights

Daylighting advantages of skylights have been known and appreciated for many years but four principal problems—condensation, glare, heat gain and loss—sometimes have prevented their acceptance. Now Pittsburgh Corning Corp. has come up with Skytrol glass blocks which they claim have been designed to overcome these problems.

• **Secret is glass screen**—The new skylight block is 12x12 in. square and 4 in. thick and has a fibrous glass screen running longitudinally through the middle. This is sealed in the block, creating two partially-vacuumed cavities. It not only gives better insulating characteristics to the block ($U = 0.43$), but also diffuses the light for better daylighting. In addition to the screen, each block has internal prisms and Soft-lite edges that combine to provide evenly-diffused daylight from a panel of uniform illumination.

• **How it's installed**—Block units are made by fusing the two sections together at high temperatures. Edges are keyed for locking into concrete and coated with a resilient plastic for firm bonding. Joint reinforcing consists of welded steel trusses (see illustration) whose top and bottom members are ½-in. deformed steel bars and diagonal members are of ¼-in. bent and welded to rods at 4½-in. centers. These trusses run in the load-bearing direction and are inserted in every joint.

Running in the opposite direction are two 2⅞-in. dia wires at the top and bottom of the trusses, also in every joint. In addition two ⅜-in. dia deformed bars run continuously around the perimeter of the slab which is, in turn, anchored to its supporting structure along the center half of the high edge only.

Form work should be strong enough to support the blocks and concrete.

• **Structural and impact strength**—Roof-light blocks will withstand a load of 1,500 lb applied over a 1-in. dia area, when installed as recommended, according to the company. As to impact, they have constantly resisted breakage by a 1-lb hard-steel ball dropped from a height of 5 ft. Even in severe test cases where the top face was broken, the bottom face remained intact. When subjected to sudden showers, cold rain, hail or snow after daylight exposure to sun-

TOP AND BOTTOM faces of Skytrol block are visible here with aid of a mirror. Top has no ridges to hold dirt.

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TRI-RIB STEEL ROOF DECK

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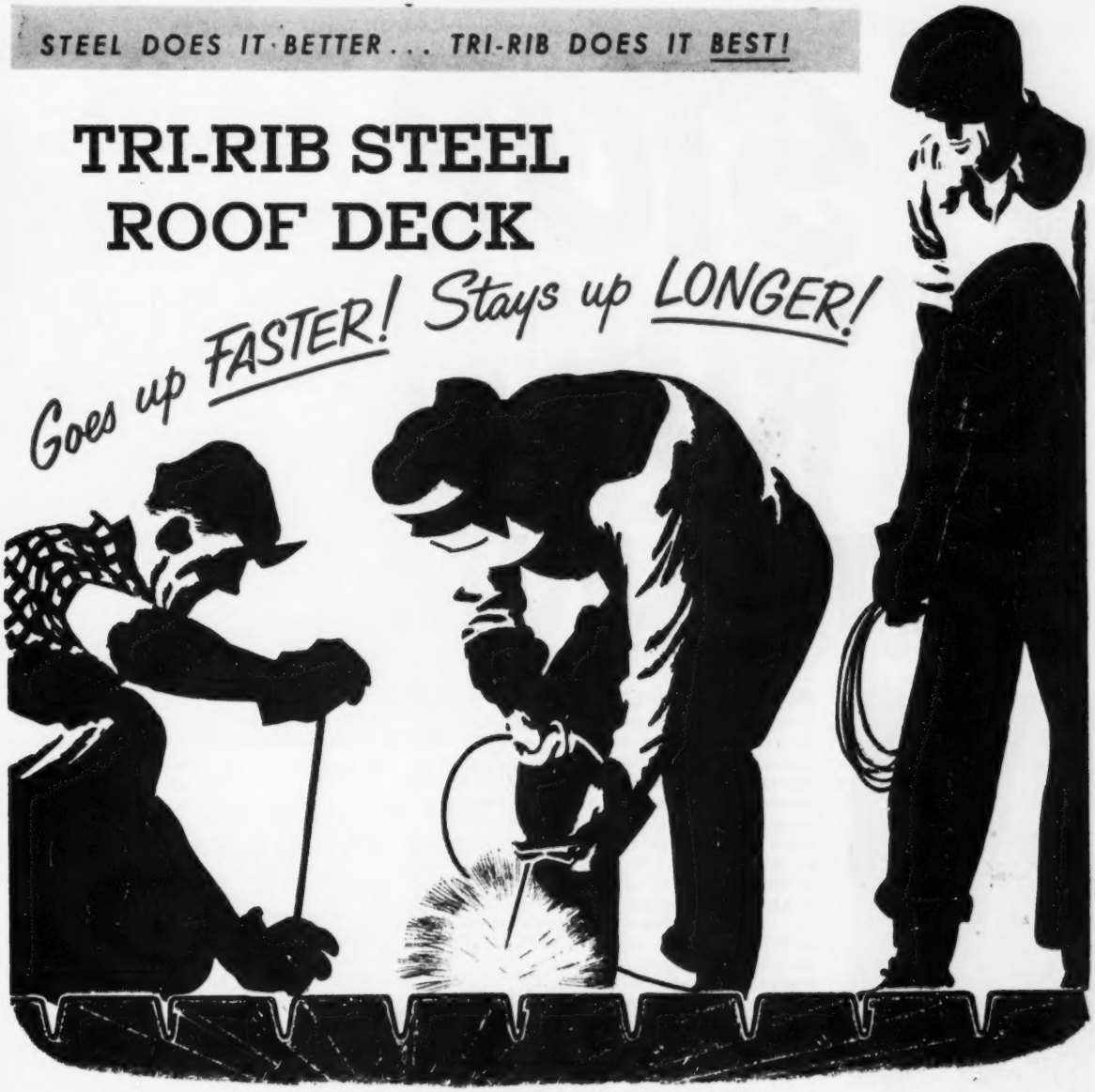

SAVES TIME! Easy-to-handle sheets of Tri-Rib are grooved for simple end-over-end attachment, either by welding or clipping. And Tri-Rib's 18-inch width, in lengths up to 22 feet, spans several purlins, means faster coverage of large areas.

SAVES MONEY! Tri-Rib not only saves money in roofing time, but actually costs less than comparable types of roofing. In addition, its lighter weight allows lighter supporting structure, effecting a still greater savings.

SAVES STEEL! The very lightness of Tri-Rib Roof Deck itself means a substantial steel saving. This in turn reduces the dead load, permitting use of fewer columns, shallower footings and eliminates the need for sub-purlins.

SAVES MAINTENANCE! A roof of Tri-Rib Steel Deck is truly a "lifetime" roof. Made of rugged, corrosion-resistant Cop-R-Loy, Tri-Rib is designed in accordance with specifications adapted by A.I.S.I. for light gauge structures, dated January, 1949.

For specifications, consult Sweets' Files, or write us.

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light, the Skytrol blocks will resist a cold shock of 100 deg F without breakage, the company claims.

Top surface of the blocks is smooth to allow for easy cleaning. No ridges can catch and hold dirt. Generally panels that have been installed with a slight slope for natural run-off can be kept clean by natural rainfall. PITTSBURGH CORNING CORP., 307 FOURTH AVE., PITTSBURGH 22, PA.

Roller chain drives added to Dodge Mfg. Co. line

A complete line of Taper-Lock sprockets and Dodge roller chain will soon be available from stocks of distributors for Dodge Manufacturing Co. In introducing these new products the 75-year-old power transmission firm thus enters the field of roller chain drives.

Claiming that the chief advantage is to bring "off-the-shelf" availability to roller chain drives, the company has achieved the application to sprockets of the Taper-Lock principle, already proved in millions of V-belt, conveyor pulley, coupling and silent chain installations.

According to Vice-president Harry A. Torson, such availability of Taper-Lock sprockets and bushings means elimination of costly reboring of sprockets to fit shafts; and turning and grinding of shaft to assure a more snug fit.

He also says that Taper-Lock is keyed to the shaft and also grips it with the firmness of a shrunk-on fit. When a sprocket is to be replaced, on the other hand, it is said to be easily and quickly removable and the bushing is reusable. DODGE MANUFACTURING CORP., MISHAWAKA, INDIANA.

Circular blade brush saw runs 4,000 rpm, weighs 30 lb

A circular brush saw, called the Wilton, operates on a gasoline and oil mixture and turns 3,500 to 4,000 rpm. It has several features including: Blade fixed at 10 deg angle to permit horizontal, ground-level cutting; adjustable handle; an assembly that permits swing upward, for vertical cutting; leg guides for extra balance; a centrifugal type clutch that engages as motor accelerates.

Powered by a 2-cycle, 1.2-hp motor, the complete unit weighs less than 30 lb. According to the manufacturer, the circular blade slashes vines, brush and saplings up to 4-in. stems. It can be swung in scythe fashion on light brush. WILLIAMS & HUSSEY MACHINE CORP., MILFORD, NEW HAMPSHIRE.

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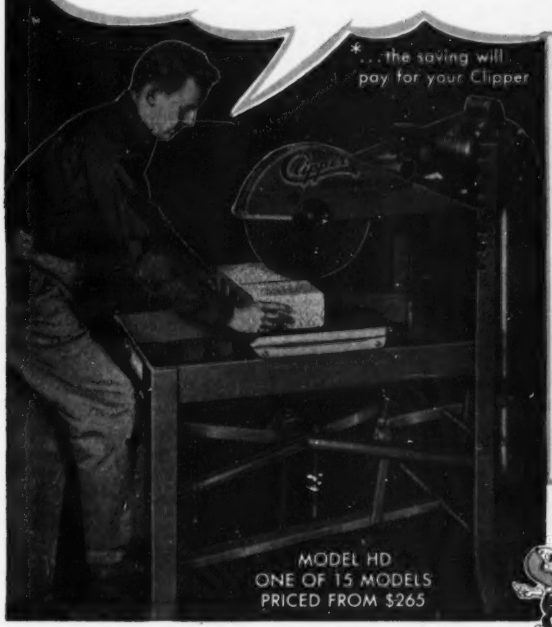

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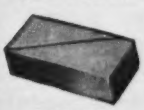

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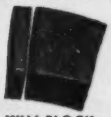

KILN BLOCK Cut in **21 SECONDS**

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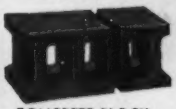

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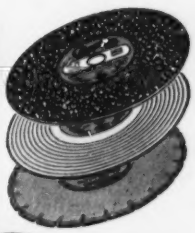

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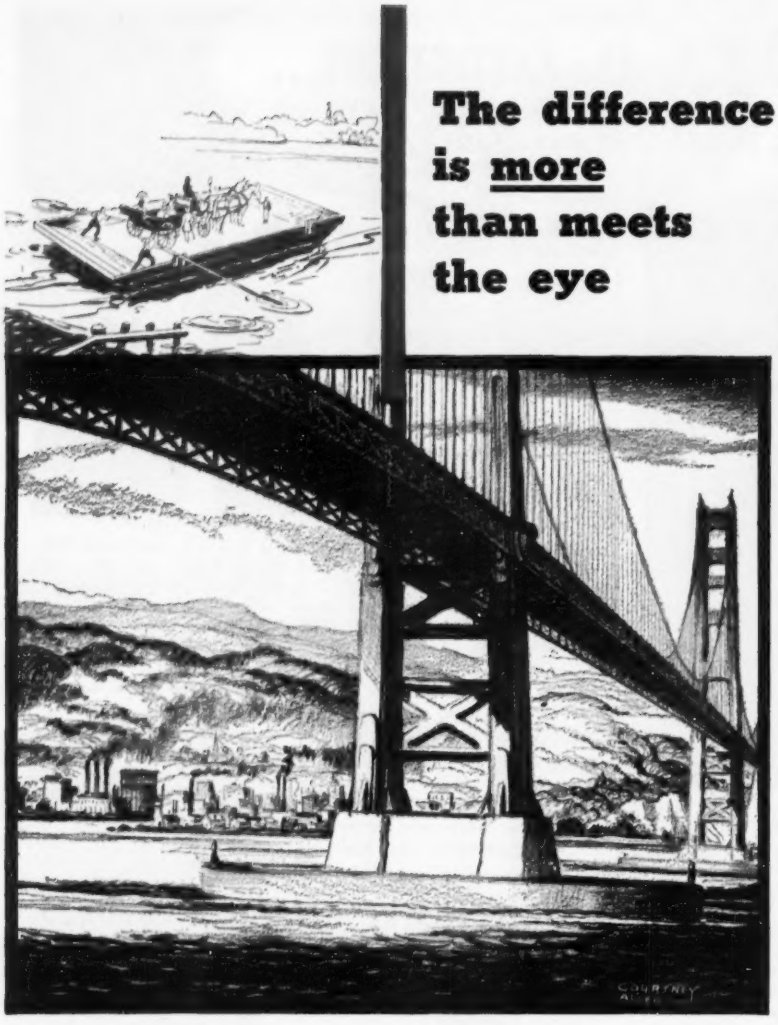

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PUBLICATIONS

Totally enclosed motors—Explosion-proof electric motors for dangerous, damp, and dusty locations is the subject of this color-illustrated 8-page booklet. Underwriters classifications, schematic details, and photographs of typical installation. Write for Bulletin 1784, U. S. Electrical Motors, Inc., Milford, Conn.

Plaster fireproofing—The body of this valuable 8-pager is a long table of ways to fireproof steel and wood structural forms with lath and lightweight fireproof plaster. The table gives sketches of wall, floor and structural member details with the method of fireproofing for each and the fire-rating with the authority who established it, whether Underwriters or Bureau of Standards. "Fireproofing with Perlite," Perlite Institute Office, 10 E. 40th Street, New York 16, N. Y.

Lightweight concrete—Lightweight vermiculite and high insulation vermiculite concrete for floor-slab and floor-fill are described with illustrations and specifications in this 12-page booklet. General properties and examples of its use are outlined instructively. Send for booklet G-18, Zonolite Company, 135 S. LaSalle St., Chicago 3, Ill.

Liquid and gas controls—Equipment for measuring and controlling liquids and gases for water, sewage, power, or process works is described in this 32-page booklet. Detail drawings, specifications, and characteristics of gages, meters, and valves are described and illustrated fully. A valuable aid for consulting plant engineers and purchasing engineers. Write for catalog 003, Simplex Valve and Meter Co., 68th and Upland Streets, Philadelphia 42, Pa.

Locomotive cranes—The advantages and special details of torque-controlled locomotive cranes are described in detail in this 16-page catalog. Various features of the cranes are illustrated with dimensions, weights of buckets and capacities are listed. Orton Crane and Shovel Co., 608 S. Dearborn Street, Chicago, Illinois.

Hoists and dump bodies—Users of dump truck bodies, hydraulic hoists, and end-loaders will find this 8-pager handy for selecting the proper equipment for their specific needs. Booklet is completely illustrated and has full data on hydraulic hoist specifications. Bulletin L-6512, Galion Allsteel Body Company, Galion, Ohio.

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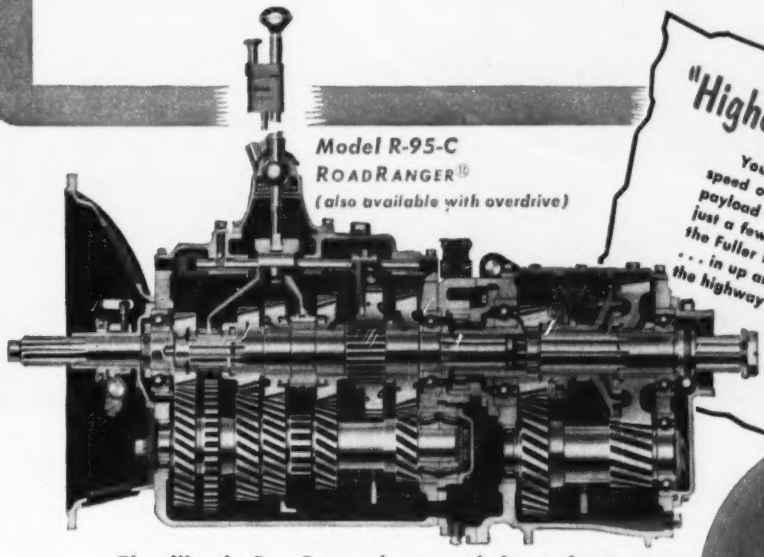

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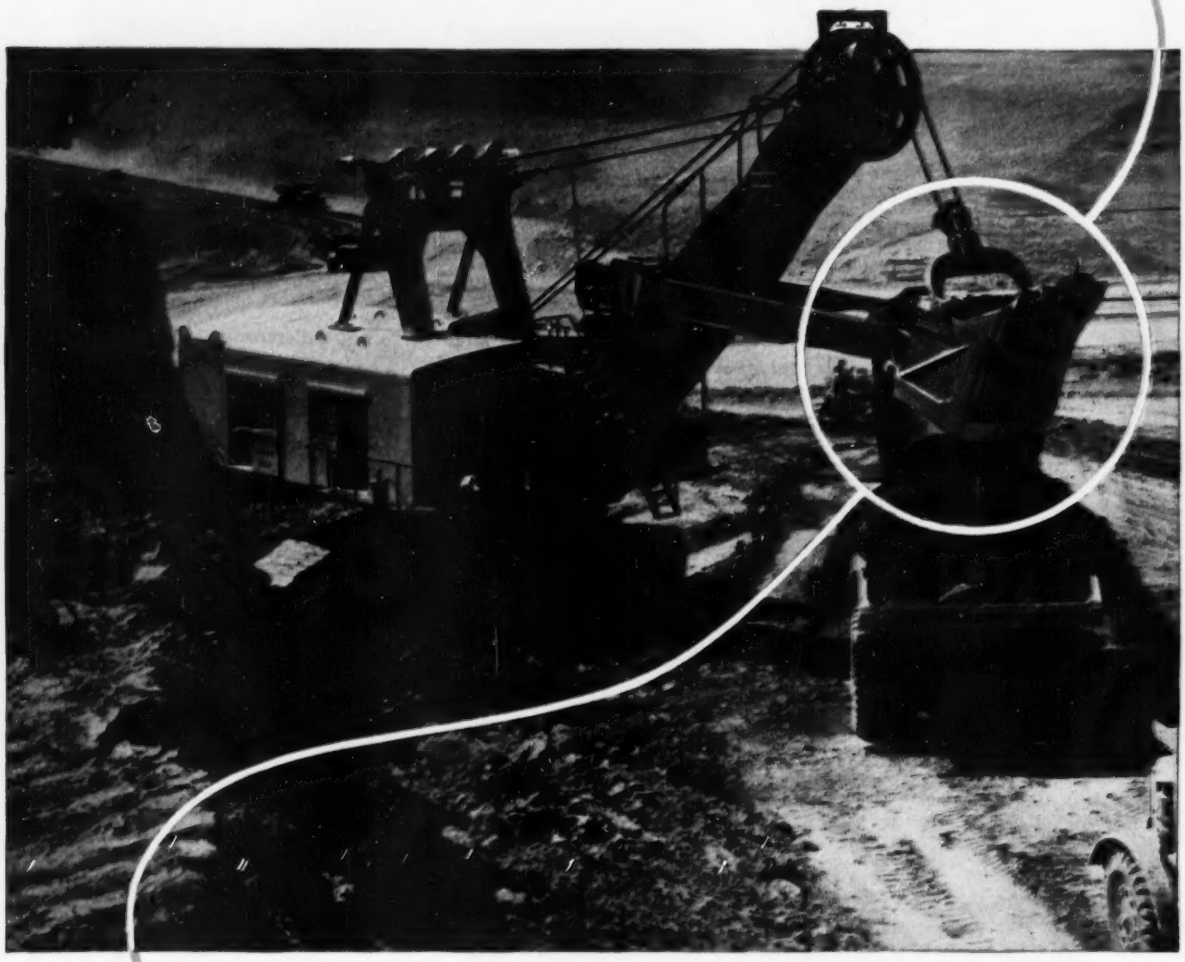

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EDITORIALS

Salvaging fire-damaged steel

FLAME STRAIGHTENING of the steel frame of a warehouse in Alameda, Calif., that had been deformed in a fire (see p. 34) points up the fact that all fire-damaged steel need not be tossed onto the scrap heap. Since the steel members in this building had not been so badly damaged as to lose their elastic properties, they could safely be restored to service when straightened out. But in more serious fires, the question of which beams to replace and which to salvage certainly would be difficult to answer. Not much has been published on this subject.

One method that has been proposed for estimating the extent of the damage is to judge by the color of the scale formed on the steel. If the scale is black, coupons might be taken for testing the strength and elasticity and for determining the grain structure. (Black scale is said to indicate temperatures of 1,200 to 1,400 F.) But if gray scale, which is formed at higher temperatures, is observed, the steel should be discarded.

The warehouse fire also raises the question as to how much more serious the damage to the steel frame would have been had light roof trusses been used instead of beams. The owner's engineers contend that with heavy beam-and-girder construction fire damage is less and more easily repaired. If they are right, isn't the salvageability of heavy beams sufficient justification for lowering fire-insurance rates for such construction?

Missouri Basin development

THE COMPROMISE PROPOSAL for development of the water resources of the Missouri River Basin put forward by the Missouri Basin Survey Commission (ENR Feb. 26, p. 24) may prove to be the best solution for a difficult problem, although at the moment the plan has few friends. The majority of the commission apparently sought a middle ground between an independent, federally appointed "Missouri Valley Authority" and the minority proposal of a supervisory body set up by compact among the states of the basin, which while largely independent of the federal government would still, presumably, have to get most of its money from Congress. The "Missouri Basin Commission" that is recommended is not unlike the river valley commissions proposed by the President's Water Resources Policy commission (ENR Dec. 21, 1950, p. 23). It would be charged with drafting an overall development plan for the basin and with coordination of the river-development activities of federal agencies such as the Army Engineers, Bureau of Reclamation and the Soil Conservation Service. The Commission would not directly supervise nor do any actual construction.

The main weakness of this part of the study commission's proposal appears to lie in its failure to specify that the Missouri Basin Commission be truly representative of the various parts of the basin. The five members of the commission simply have to be residents of the Missouri valley. Thus they all could come from the southern part of the valley where thinking on water problems is quite different from that in the semi-arid north and western sections.

But in its basic proposals, the survey commission's report has much to recommend it, as it does not propose to take river work and reclamation projects away from existing federal agencies, and so will not meet the strong opposition in Congress that otherwise would be the case. It seeks to reverse the trend of the last 20 years toward making the federal government pay more and more of the total cost of river development work. It calls for zoning the flood plains of river valleys to end the encroachments that have restricted the flood-carrying capacity of the natural river channels. And it urges a realistic reappraisal of all proposed river work in the Missouri Valley, including the costly maintenance of a 9-ft navigable channel.

The present administration is not apt to adopt this Truman-sponsored report as its own, but it would be shortsighted merely to file and forget it.

Levees vs. reservoirs again

AS IF IN ANSWER to some of the valley-wide proposals of the Missouri Basin Survey Commission noted above, a group of able consulting engineers has come up with a re-appraisal of flood control plans for the Kansas River (ENR March 5, 1953, p. 21). Their conclusion: Abandon storage reservoirs in favor of levees and wider flood channels. The levees would be used to protect the cities, while farms in the lowlands would take the floodflows as they occurred.

The claim is that savings of more than a half billion dollars can be effected. The proposal is the same one that generated so much heat among flood control experts, two to three decades ago, when control plans for the Lower Mississippi were overhauled. Then, it will be recalled, the great 1927 flood caused an abandonment of the "levees only" philosophy, first in favor of supplemental floodways, and then, in 1935, of the addition of storage reservoirs on the tributaries. The Kansas River reservoirs now being attacked are in fact a result of this decision.

In one respect, therefore, the Kansas report is a challenge to the current philosophy of flood control. Probably, however, it will be found to be of narrower scope than that, merely challenging the use of reservoirs in a particular kind of valley. The resulting discussion should be useful and enlightening.

Boeing Airplane Co., Wichita, Kansas. Pozzolith Concrete used in apron and hangar. Consltg. Engr. — Wilson & Co., Salina, Kansas; Hangar Contr.—Manhattan Construction Co., Inc., Muskogee, Okla.; Hangar concrete supplied by Walt Keeler Concrete Co., Wichita, Kansas; Apron Contr.—Peter Kiewit & Sons Co., Wichita, Kansas, who also produced the concrete for apron.

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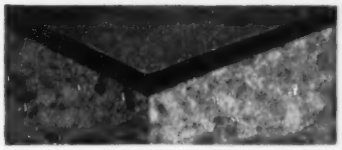

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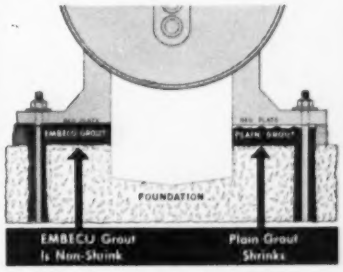

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Constructing a plant-mixed Texaco Asphalt pavement of the cold-laid type on Indiana State Highway 28 near Alexandria. Old pavement was widened and undersealed with asphalt. Contractor-Brooks Construction Co., Fort Wayne, Indiana.

Indiana gives old highway a new

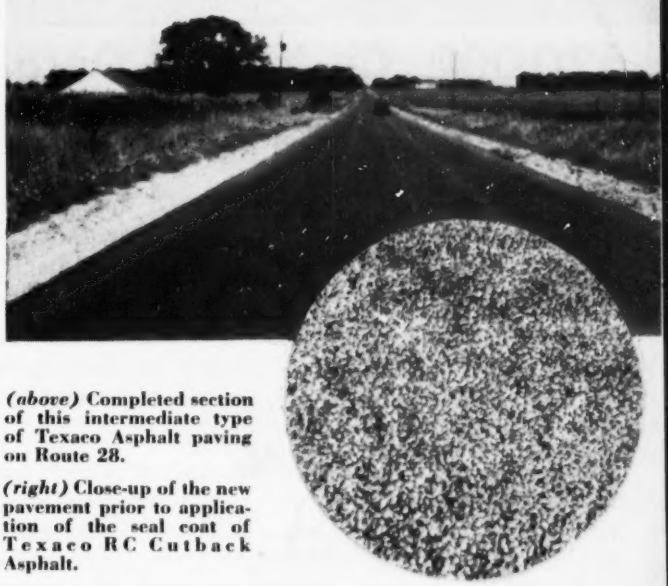
intermediate-type Asphalt surface

Indiana chose one of the intermediate types of asphalt construction when it modernized this section of State Route 28 last year. The new surface is of the plant-mixed, cold-laid type, in which a Texaco Rapid-curing Cutback Asphalt serves as binder for the broken stone aggregate. This surface was put down in two courses, with an interval of five days between courses for curing and setting up. A seal coat of RC Cutback, covered with chips, completed the new pavement.

This is another of the complete range of road and street types which Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils offer the road builder. These types vary in durability and in cost. Among them, you will find the answer to your own street, highway or airport improvement problem, with due consideration being given to traffic, available aggregate and budget limitations.

Whether used in a heavy-duty pavement or an inexpensive surface-treatment, Texaco Asphalt products deliver a consistently dependable performance, because they are refined from scientifically selected crudes and are backed by half a century of asphalt refining experience.

Helpful information about the various plant-mixed types of Texaco Asphalt paving, as well as those types in which Texaco products are applied by pressure distributor, is presented in two booklets which our nearest office will send you with no obligation on your part.



(above) Completed section of this intermediate type of Texaco Asphalt paving on Route 28.

(right) Close-up of the new pavement prior to application of the seal coat of Texaco RC Cutback Asphalt.

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